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HANDBOOK
OF



SOUTH AUSTRALIA.



BY

DAVID J. GORDON,

AUTHOR OF

"The Central State: South Australia, Its History, Progress, and Resources" (1903);

"The 'Nile' of Australia: Nature's Gateway to the Interior" (1906);

"Conquering the Desert" (1907), &c., &c.



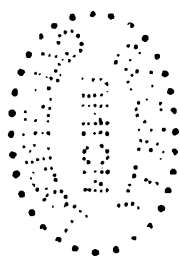
ISSUED BY THE GOVERNMENT OF SOUTH AUSTRALIA.

With over 280 Illustrations.

Adelaide:

C. E. BRISTOW, GOVERNMENT PRINTER, NORTH TERRACE.

1908.



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PREFACE.

THIS Handbook has been prepared under instructions from the Hon. the Chief Secretary (Hon A. A. Kirkpatrick), and is published by the authority of the Government. Its object is to serve as a Guide to Immigrants, Tourists, and Settlers, as well as an official record for reference within and beyond the Commonwealth.

The aim has been to supply a brief outline of the history of South Australia, an account of the growth of leading industries, and to provide such information of the resources of the State as will indicate the scope for further industrial expansion. Every effort has been made to select illustrations typical of the industries treated and of pleasure resorts within easy reach of the traveller. So far as possible each section has been made complete in itself, but the whole work is intended to convey an accurate idea of the remarkable progress and prosperity of the State, and to set forth the opportunities which are available to all who wish to share in the further development of the great natural resources of a well-favored land.

DAVID J. GORDON.

ADELAIDE, *December 1st*, 1908.

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HON. A. A. KIRKPATRICK,
Chief Secretary.



HON. T. PRICE.
*Premier and Commissioner of
Public Works.*



PARLIAMENT HOUSES, NORTH TERRACE, ADELAIDE.

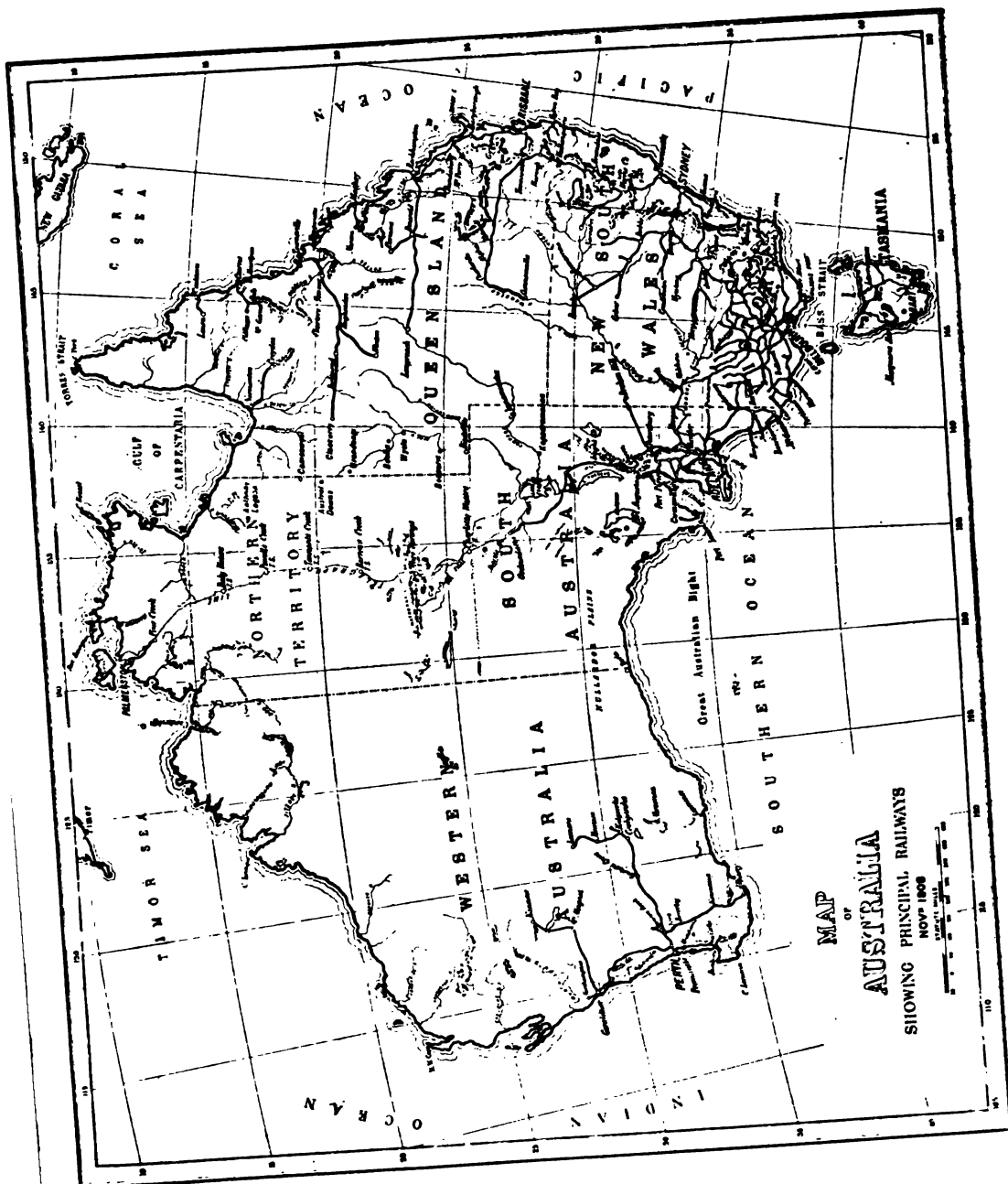


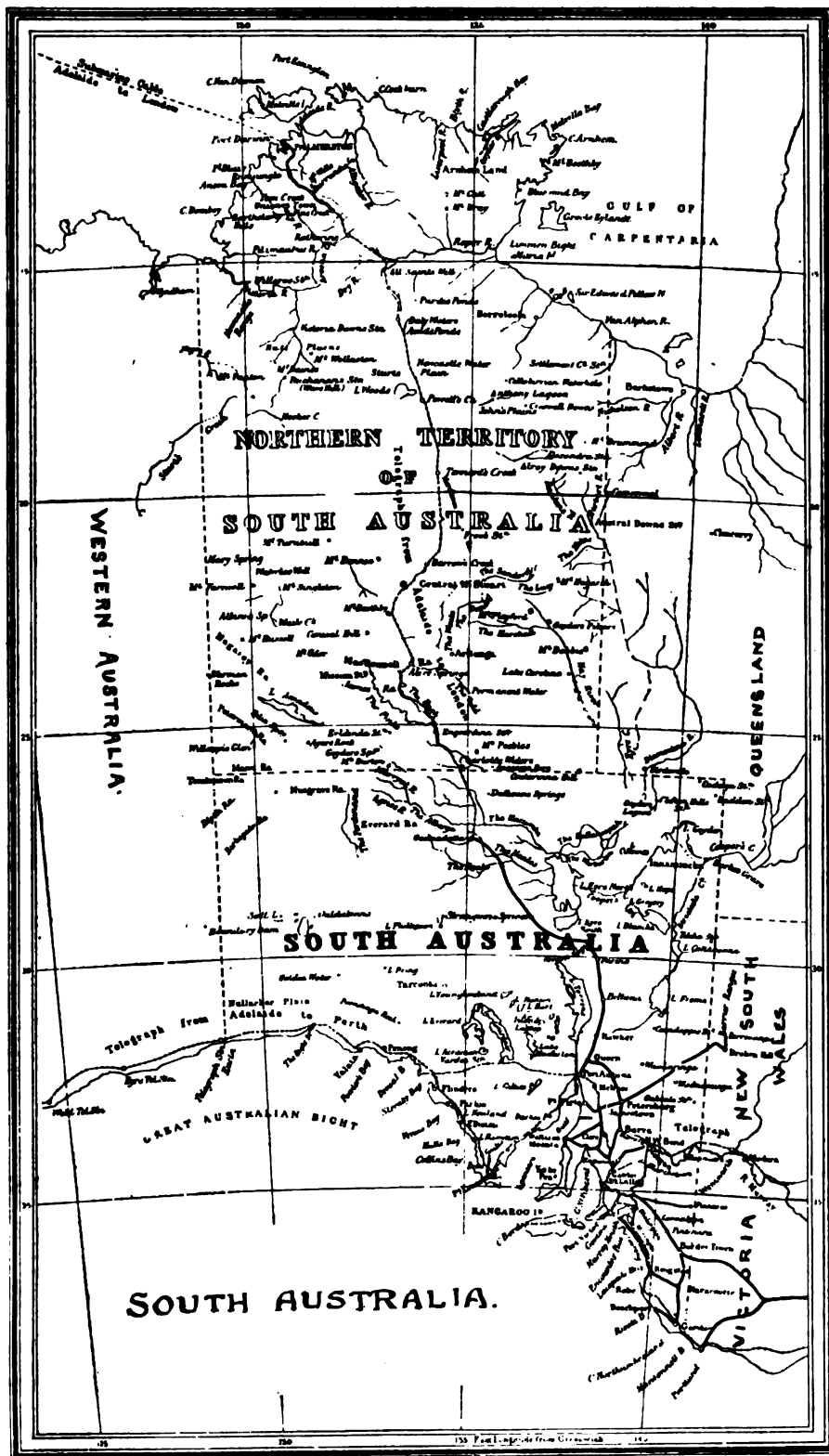
HON. L. O'LOUGHLIN,
Commissioner of Crown Lands.

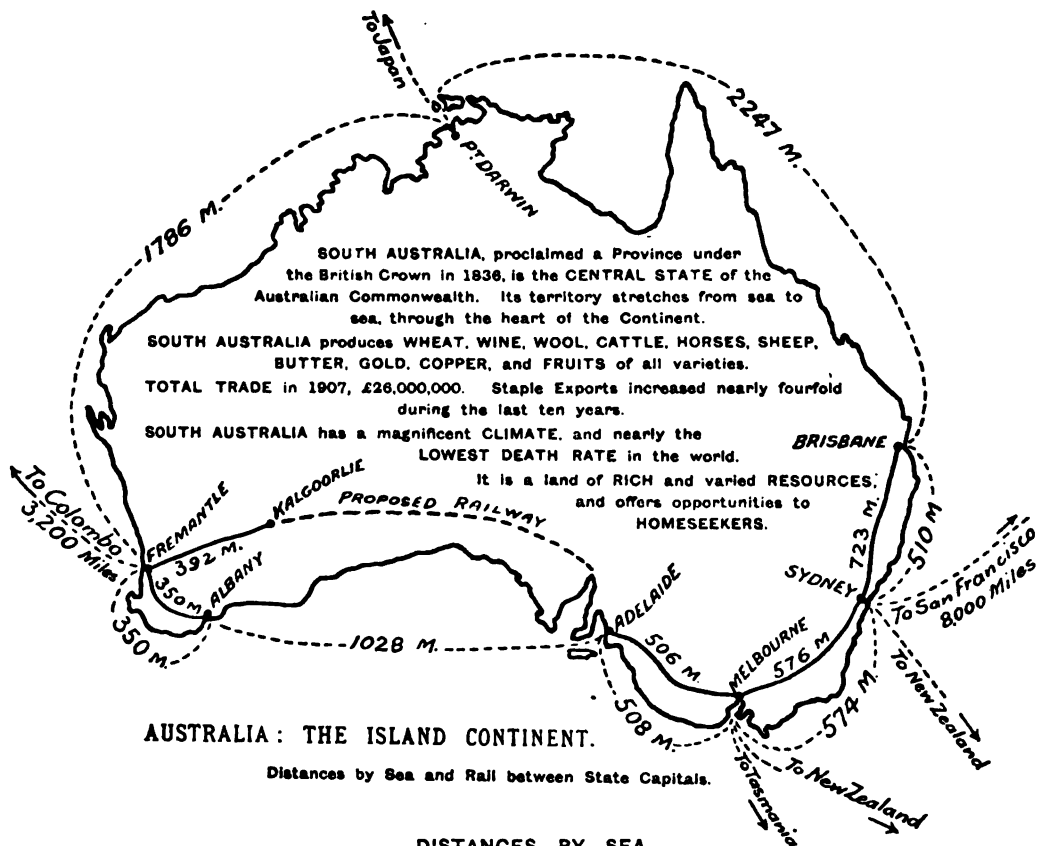


HON. A. H. PEAKE,
Treasurer.

MEMBERS OF THE SOUTH AUSTRALIAN MINISTRY.







DISTANCES BY SEA.

From.	To.	Miles.	From.	To.	Miles.
Adelaide	Melbourne	508	Adelaide	Colombo	4,578
Melbourne	Sydney	574	Adelaide	Calcutta	5,640
Sydney	Brisbane	510	Adelaide	Singapore	3,850
Brisbane	Port Darwin	2,247	Adelaide	Hongkong	5,290
Port Darwin	Fremantle	1,786	Adelaide	Yokohama	6,720
Fremantle	Albany	350	Adelaide	New York	11,580
Albany	Adelaide	1,028	Adelaide	San Francisco	9,082
Round the Continent		7,003	Adelaide	Capetown	5,760
			Capetown	London	6,129
			Adelaide, <i>via</i> Suez	London	10,760

GEOGRAPHICAL AND STANDARD TIME.

The following are the geographical positions of the Australian capitals and the differences of their respective standard times from Greenwich mean time:—

	Longitude.	Latitude.	Standard Time Fast on Greenwich Mean Time.
	° ' S.	° ' E.	
Adelaide	34 56 S.	138 35 E.	9h. 30m. os.
Melbourne	37 50 S.	144 59 E.	10h. om. os.
Sydney	33 52 S.	151 12 E.	10h. om. os.
Brisbane	27 28 S.	153 2 E.	10h. om. os.
Perth	31 57 S.	115 50 E.	8h. om. os.
Hobart	42 52 S.	147 21 E.	10h. om. os.





PICTURESQUE SCENERY: MOUNT LOFTY RANGES, NEAR ADELAIDE.


SOUTH AUSTRALIA: The Central State:

ITS PROGRESS AND RESOURCES.

A GUIDE FOR IMMIGRANTS, TOURISTS, AND SETTLERS.

CHAPTER I.

STATE AND COMMONWEALTH.

OUTH Australia is the Central State of the Australian group. It links East with West, and its borders touch four out of the six States forming the Commonwealth of Australia. The waters of the Southern Ocean wash its shores in temperate latitudes, the waves of the Indian Sea beat upon the coastline of Tropical Australia. South Australia, with its dependency the Northern Territory, extends from sea to sea through the heart of the Continent, covering 26 degrees of latitude and 12 degrees of longitude. The State is four times the size of France, and could accommodate within its borders seven United Kingdoms! The area of South Australia is 578,361,600 acres, and, as will be understood, there is in this immense extent of country variety of climate and soil and vast resources. The total population is approximately 400,000.

South Australia was proclaimed a province on December 28th, 1836, and on January 1st, 1901, the province became one of the six States constituting the Commonwealth of Australia.

The Gift of a Continent. History fails to supply a parallel to the peaceful occupation of the Australian Continent. Not one British soldier or sailor has been called upon to sacrifice his life in order to secure or to hold it for the Empire. An English writer stated in 1848—"Australia is the greatest accession to substantial power ever made by England. It is the gift of a Continent unstained by war, usurpation, or the suffering of a people."

The bloodless conquest of the "Great South Land" was followed by the trial of various systems of colonisation. That employed in the founding of South Australia was unique because of its ideal principles and the new theory of political economy which they represented. The colonisation and expansion of the Australian group represent one of the most glorious triumphs of the nineteenth century. A continent had to be explored, rivers bridged, forests cleared, and a never-ending war waged against unknown natural conditions. Fire, flood, and famine confronted the early settler as he sought to make a home in the bush. These and other foes continued to cross the path of the pioneer as he pushed his way into the heart of an unknown continent, undismayed by the failure of others, confident in his own strength, unconquerable in patience and determination. Progress in other directions has been no less substantial and significant. In no other country is there to be found greater political freedom or social equality; better facilities for education in all its branches—more certainty that each "shall reap where he has sown"—than in that Commonwealth representing the union of once divided States. At the beginning of the nineteenth century Australia was practically unknown. A handful of white people were located on one little spot on the eastern shore within sound of the Pacific Ocean. To-day there are few blanks in the map, although much remains to be done in developing the known resources of the country and seeking new avenues of employment. On

December 31st, 1906, there was a population of 4,119,481. "Although Australasia," says Mr. Coghlan, in "The Seven Colonies of Australasia," "has but the population of a province of some of the great European powers, in the wealth and earnings of its people it stands before most of the secondary States, and as regards wealth and income per head of population it compares favorably with any country."

An Official (Federal) Statement. Sir John Forrest, when Federal Treasurer, concluded his Budget Speech, delivered on July 31st, 1906, in the following terms:—"I would ask Honorable Members to try to realise what the 4,000,000 of British people in Australia have done and are doing. They have £107,000,000 upon deposit at the banks, of which over £23,000,000 are in coin and bullion.

They have deposits in the Savings Banks of over £37,000,000, and the number of depositors is 1,152,506. They have produced minerals to the value of £636,000,000, of which £24,766,000 were produced during 1905. Of this £636,000,000, the sum of £462,439,000 represents the production of gold, and of that quantity £15,500,000 worth was produced in 1905. They have 9,380,000 acres under cultivation, not including grass and fallow lands. During the last two years they have produced wheat valued at £18,766,000, and have exported butter valued at £4,792,000. They have 75,000,000 sheep, 8,000,000 cattle, 1,600,000 horses, and 1,000,000 pigs. Their sheep have increased during the last three and three-quarter years by 22,000,000, and the value of the wool produced is now over £20,000,000, having increased during the same period by £7,000,000. In 1906 their overseas trade represented £95,000,000; their imports being of the value of £38,000,000, and their exports of the value of £57,000,000. I am glad to say that 71 per cent. of this trade was with the people of the British Empire—our own people—the remaining 29 per cent. being with the people of foreign countries. The value of their imports is £15,000,000 less than those of Canada; but their exports exceed in value those of Canada by £13,000,000 (the population of Canada being 6,000,000, as compared with our population of 4,121,000), and of South Africa by £25,000,000. The people of Australia produce annually about £3,000,000 worth of hay, £1,400,000 worth of potatoes, and 6,000,000galls. of wine. They have a grand total of primary annual production, including manufactures, representing a value of about £120,000,000 a year. They have great and populous cities, railways, tramways, water supplies, telegraphs, telephones, shipping facilities with the world and on their coasts, and are in the enjoyment of most of the advantages, conveniences, and luxuries of the old world. They have thirty times as many sheep and produce forty times as much wool as Canada, whilst they have five times as many sheep as in the whole of South Africa. They produced last year 54,000,000bush. of wheat, being only 15,000,000bush. less than the output of Canada, which is regarded as the granary of the world. They produced nearly five times as much gold as Canada, their product being valued at only £1,500,000 less than that of South Africa, which has been considered as the greatest gold producer of recent times. This is what the people of Australia—4,000,000 British people—are doing."



Prize Horses and Cattle at an Agricultural Show.

Australia Compared with Europe.



[Prepared by A. C. MacDonald, Secretary of the Victorian Branch of the Royal Geographical Society of Australasia]

Some idea of the vastness of the Australian Continent may be gathered from the above map, which shows that Australia could swallow up nearly the whole of Europe. Drawn to scale, without alteration of their positions, with the exception of Sweden, Norway, and Russia, there is a balance (the black portion) which would provide for Sweden and Norway, and for more than two-thirds of Russia. For further comparison study the areas given below.

	Square Miles.		Square Miles.
Austria-Hungary	240,942	Portugal	36,938
Belgium	11,373	Roumania	50,720
British Isles	120,994	Russia	2,095,616
Bulgaria	24,380	Spain	197,670
Denmark	15,360	Switzerland	15,976
France	204,092	Turkey	65,752
Germany	208,830		
Greece	25,914	Total Square Miles	3,609,827
Holland	12,048	Australia's Square Miles	2,972,906
Italy	110,646		
Norway and Sweden	172,576	Difference	636,921

CHAPTER II.

DISCOVERY OF SOUTH AUSTRALIA.



ALTHOUGH Lieutenant Grant sighted the southern shores in 1800, and named Mount Gambier, Cape Northumberland, and other places along the coast, Flinders, by forestalling his rival—Baudin—in 1802, and Sturt, in following the Murray river to its mouth in 1830, were the real founders of South Australia. These great Englishmen explored as well as discovered. They were keen observers, possessed of cool deliberate judgment. When circumstances compelled deductions to be made from uncertain premises there came to their aid a natural instinct suggestive of prophetic vision. Especially is this true of Captain Sturt. His estimate of the potential value of the rivers Murray, Darling, and Murrumbidgee has been more than justified. Flinders, Sturt, and subsequently Captain Barker, removed many false impressions concerning the character of the southern portion of the continent. In 1627 Dutch navigators sighted the southern coast of New Holland. Beyond christening it "Nuytsland" they took no notice

of what they regarded as a rough, inhospitable, barren country. Matthew Flinders was the first to set foot on the shores of Southern Australia, and to his painstaking inspection was chiefly due the settlement which followed. He discovered, named, and charted capes, bays, gulfs, and islands, often landing to make a careful examination of the soil and to take observations from hilltops. The general opinion in New South Wales as well as in England was the same as that expressed by the early Dutch voyagers: that the southern portions of the continent consisted of inhospitable country, not fit for habitation by white people.



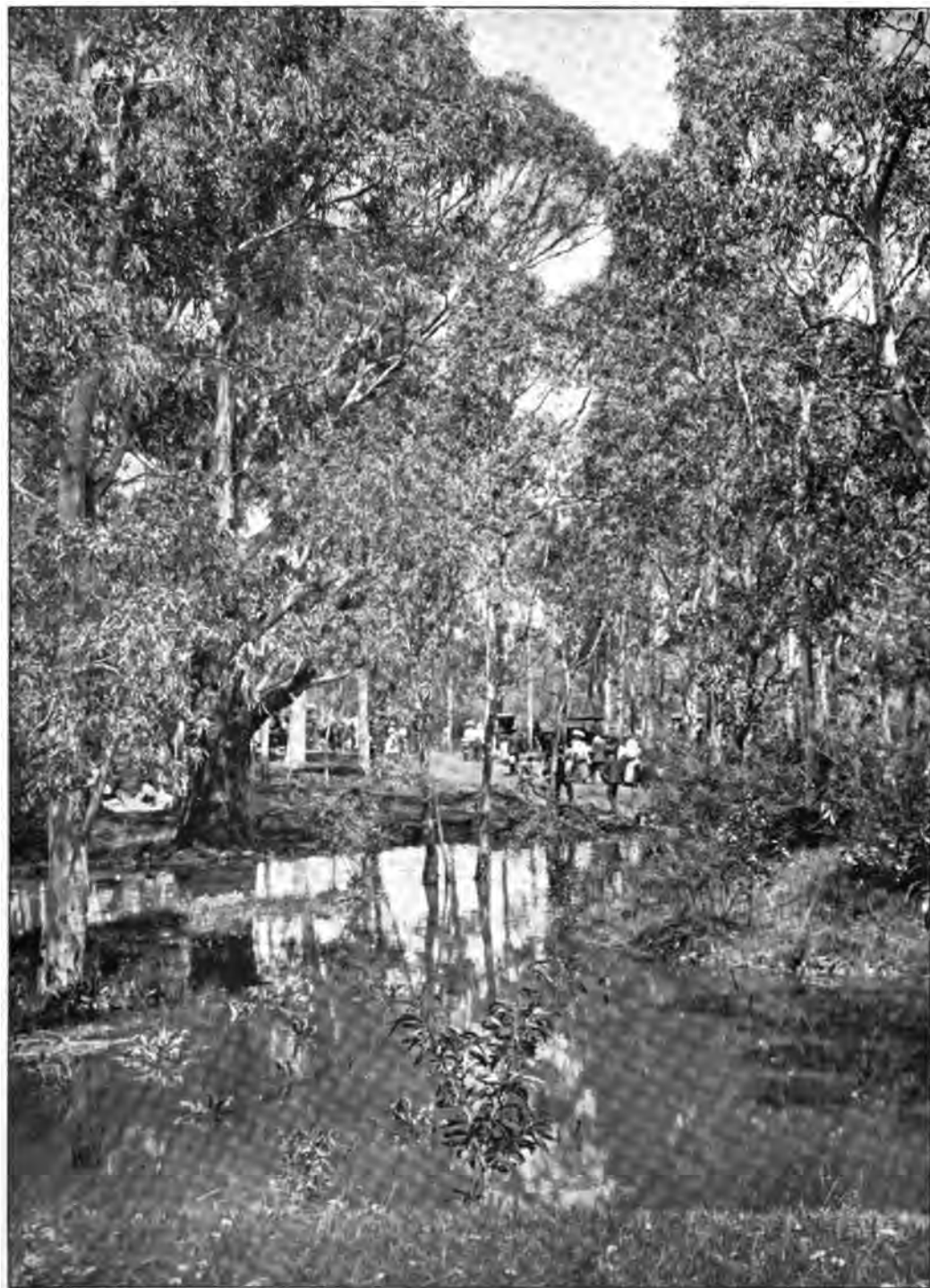
CAPTAIN MATTHEW FLINDERS, R.N.

In 1822 a naval captain read a paper before a society in New South Wales, in which he stated:—"The south coast of Australia is barren, and in every respect useless and unfavorable for colonisation." The following is probably the earliest expressed opinion of South Australian soil. It was written by Matthew Flinders in 1802:—"The soil of that part of Kangaroo Island examined by us was judged to be much superior to any before seen, either upon the south coast of the continent or upon the islands near it; with the exception of King George's Sound. The depth of the soil was not particularly ascer-

tained; but from the thickness of the wood it cannot be very shallow. Some sand is mixed with the vegetable earth, but not in any great proportion, and I thought the soil superior to some of the land cultivated at Port Jackson, and to much of that in our stony counties in England."

Early Explorers.

Captain Sturt, the first man to discover that the country had many natural advantages, floated down the Murray in a small rowing boat, with convicts as companions. This journey represents one of the greatest triumphs in the annals of Australian exploration. He ran the gauntlet of hostile natives, endured terrible hardships, and, keenly disappointed at finding that the noble stream ends at a point which encounters the full force of the Southern Ocean, turned about and rowed up stream to his starting place. It was a wonderful achievement—



(CH. II.)

THE NATIONAL PARK: THE PEOPLE'S PLAYGROUND.

one of the most daring and successful accomplished during a long and chequered career. In his account of this memorable journey down the Murray in 1830, Captain Sturt wrote :—
 “ We were borne over the ruffled and agitated surface of Lake Alexandrina with such rapidity that I had scarcely time to view it as we passed, but, cursory as my glance was, I could not but think I was leaving behind me the fullest reward of our toil, in a country that would ultimately render our discoveries valuable, and benefit the colony for whose interests we are engaged. Hurried, I would repeat, as my view of it was, my eye never fell on a country of more promising aspect, or of more favorable position, than that which occupies the space between the lake and the ranges of St. Vincent’s Gulf, and, continuing northerly from Mount Barker, stretches away without any visible boundary. It appeared to me that, unless Nature had deviated from her usual laws, this tract of country could not but be fertile, situated as it was to receive the mountain deposits on the one hand, and those of the lake upon the other.”



View of King William Street, the Main Thoroughfare of the City of Adelaide.

[McGann, Photo.]

Captain Sturt (after his great inland journey in the forties) wrote :—“ Taking South Australia in its length and breadth, the quantity of available land is, beyond doubt, very limited ; but I regard it as exceedingly good, and believe that its capabilities have by no means been ascertained. I feel satisfied, indeed, that necessity will prove not only that the present pastoral districts are capable of maintaining a much greater number of stock upon them than they have hitherto borne, but that the province is also capable of bearing a very great amount of population ; that it is peculiarly fitted for a rural peasantry, and that its agricultural products will be sufficient to support masses of the population employed either in its mining or manufactures. In this view of the subject it would appear that Providence has adapted the land to meet its new destinies, and that nothing we can say, either in praise or censure of its natural capabilities, will have the effect of concealing either the one or the other as time shall glide on. . . . The climate of South Australia is admirably adapted for the growth of fruit

trees of the hardier tropical kinds. The vine, the fig, the pomegranate, and others flourish beyond description, as do English fruit trees of every kind. Such trees as are congenial to the climate arrive at maturity with incredible rapidity, and bear in the greatest abundance. There are in South Australia two periods of the year which are equally deceptive to the stranger. The one is when the country is burnt up and suffering under the effects of summer heat—when the earth is almost herbless, and the ground swarms with grasshoppers—when a dry heat prevails in a calm still air. The other, when vegetation is springing up under the early rains and everything is green. Arriving at Adelaide during the first period, the stranger would hardly believe that the country, at any other season of the year, would be so clothed with herbage and look so fresh; arriving at the other, he would equally doubt the possibility of the vegetable kingdom being laid so completely prostrate, or that the country could assume so withered and parched an appearance; but these changes are common to every country under a similar latitude, and it would be unjust to set them down to its prejudice or disadvantage.

Both in climate and other respects it is a country peculiarly adapted to the pursuits and habits of my countrymen. It is a country to which an Englishman may migrate with the most cheerful anticipations."

In 1831 Captain Collet Barker, of the 39th regiment, when on his way from King George's Sound to Sydney, entered St. Vincent's Gulf and landed on its eastern shore twelve miles north of Cape Jervis. With six members of the ship's company Captain Barker crossed the Mount Lofty Ranges, discovered the mount which bears his name, and proceeded along the shores of Lake Alexandrina to the Murray Mouth. For the purpose of making observations from the top of a sandhill he successfully performed the dangerous feat of swimming across the river where it joins the ocean. This gallant officer and daring explorer was killed by the natives, who threw his body into the sea. Captain Barker's name stands first in a long list of explorers who have laid down their lives in the bush of Australia in the service of humanity. A member of Captain Barker's party wrote:—"The soil was rich, there was abundance of the finest pasturage, no lack of fresh water, and it was a spot in whose valleys the exile might hope to build for himself and for his family a peaceful and prosperous retreat."

Flinders, Sturt, and Barker made possible the colonisation of South Australia by their early travels and the favorable opinions they expressed concerning the quality of the soil and the splendid climate. Experience has shown that their judgment was sound, but that the quantity of "good land" is larger in proportion than they were able to estimate. Once the Province was proclaimed and settlement established, the work of exploration was vigorously continued. South Australia has been fortunate indeed in her explorers and pioneers, for they have made possible the rapid forward march of a resourceful industrial army.

Mr. Anstey, a pioneer colonist, writing of Sturt and Eyre, said:—"Both Eyre and Sturt were men of rare mark. They were the most courageous of explorers; the hardest, most original minded of men in the pursuit of their darling objects of noble ambition. In mind and personal manner they were widely different the one from the other, but they were both impelled by the same strong impulse—an all-absorbing sense of duty."





(CH. III.)

WATERFALL MOUNT LOFTY RANGES.

CHAPTER III.

PROCLAMATION OF THE PROVINCE.

THE revised opinions of Flinders and Sturt concerning the capabilities of Southern Australia reached England during a period of political upheaval and social unrest. The effect of the great financial panic, which started in 1825, was still felt. The French Revolution threatened to spread across the channel. When this danger had passed, the long and bitter struggle in connection with the Reform Bill began. Riots were frequent, and the hero of Waterloo was bombarded in his own house by a London mob. So gloomy was the outlook for political and religious liberty that longing eyes were cast toward distant outposts of the Empire, and the spirit which induced the Pilgrim Fathers to go West in the *Mayflower* was at work once more. This leavening influence spread rapidly, and caused a ready response to an attractive proposal of colonisation in southern latitudes then announced for the first



After Seventy Years.—Scene at Glenelg on Commemoration Day, 1906.

[McGann, Photo.]

time. The results of the voyage made by Flinders were well known, and when Sturt's graphic account of his trip down the Murray reached England, it fired the imagination of those looking for distant fields in which to establish peaceful homes far removed from all the strife and oppression of the homeland. In 1831 a committee was formed and negotiations opened with the Government for a charter to found a colony. These fell through, but the scheme

was not by any means abandoned. The promoters were not the kind of men to lose heart at the first rebuff. They had studied the history of colonisation in Canada, New South Wales, and Western Australia, and their purpose was to avoid the mistakes made in those countries. Their intention was to start a settlement on sounder principles of political economy, and with a higher regard to the rights of colonists.

Wakefield's System of Colonisation. Undismayed by failure, a second committee was formed in 1834, under the name of "The South Australian Association." With the valuable co-operation of "The South Australian Company," an offspring of it, this association "well and truly" laid the foundation of South Australia. Colonel Torrens, at a preliminary meeting held at Exeter Hall in June, 1834, moved the main resolution:—"That in establishing colonies, great care



The Town Hall and Adjoining Municipal Offices.—Scene at the Swearing-in of a Governor.

[Gazard, Photo.]

ought to be taken to combine labor and capital with land in such proportions as are best calculated to ensure the prosperity of all classes of society, and that, in establishing modern colonies, this important consideration has been generally overlooked." The colonel, in confident and eloquent phrases, spoke of the failures of colonisation in the past, and explained that in the new province about to be founded the aim was to so apportion the land as to ensure success from the outset. "It is in the first place determined that the whole of the land in the colony shall be declared to be public property. No individual can, by any means, or through any interest, acquire any portion of the land by gift. Not a single acre will, under any circumstances, be given away to individuals . . . All will be set up at a fixed minimum price, or as much above that price as the competition of public auction will determine." The theory was that of Mr. Edward Gibbon Wakefield, and his plan was by the sale of lands to provide funds; keep the new settlement in a state of solvency; supply labor; and at the same time check trafficking in land.

Closer settlement was aimed at if it were not altogether accomplished. The Wakefield system—"to fix the price of land sufficiently high to create an emigration fund, consisting of the entire proceeds of all the land sold, and to apply such fund to the exportation of laboring emigrants"—upon which South Australia was founded, and to which great importance was attached by pioneers, fell into disfavor owing to the financial crisis of the early forties. This ideal of colonisation, if one may so term it, has been subjected to considerable criticism, but the principle of utilising a portion of the revenue derived from land sales to induce immigration was followed for some years. On April 22nd, 1853, a leading article was published in *The Register*, under the heading "Superiority of the South Australian Land Sale System." It was stated, *inter alia* :—"Sad as were the immediate prospects for South Australia when drained of the industry of a large portion of her population at the first outbreak of the gold



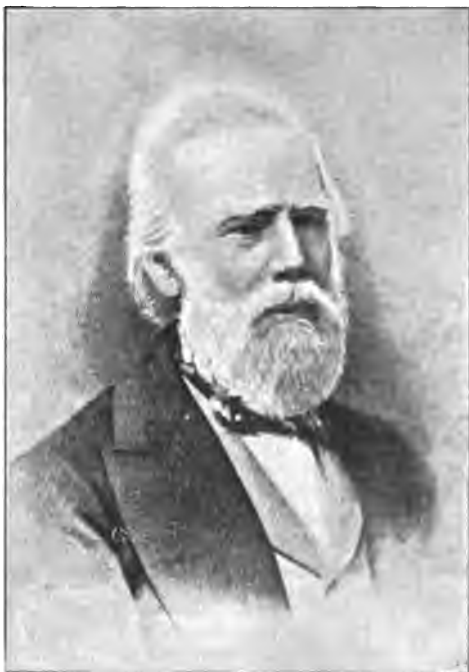
North Terrace, looking East, showing the Institute, Public Library, and University Buildings on the Left.

[McGann, Photo.]

discoveries in Victoria, infinitely worse would it have been for her had not the previous working of her admirable land sale system furnished a moral guarantee for their eventual return. It was that which gave its crowning value to the restorative instrumentality of our providential Bullion Act. . . . To feel convinced how strong is this desire to purchase Crown lands, and how eagerly the people avail themselves of the extreme facilities which our Government has wisely provided for its gratification, it is enough to look at the sales which have latterly been effected of South Australian lands. In the year 1852 there were sold upwards of 85,000 acres, realising £99,081. A grand total of 52,913 acres of Crown lands was sold during the first three months of the present year, realising an aggregate amount of £65,906, being at the rate of upwards of a quarter of a million sterling per annum. . . . Though we may not be able to invite to particular spots where gold may be grubbed up wholesale in its native state, we can offer the far more important attractions of an immense extent of first-rate land, of which moderate-sized sections can be purchased of the Government any day of the week

at £1 per acre, and the industrious cultivation of which will bestow upon its possessors in the long-run more health, more wealth, more happiness, and more wisdom than the precarious and unimproving search for nuggets in the gullies and mountain ranges of the gold regions of our squatter-oppressed and land-cultivation-prohibiting sister colony of Victoria." Many of those who now so strongly condemn the Wakefield principle owe their presence in South Australia to the help it gave them to cross the seas. Mr. Dutton, writing of it in 1846, said:—"That this (Wakefield) system was a sound one and worked successfully is now not a matter of doubt, but of historical record; but it is equally certain that its early operations were fraught with difficulty and trial." The principle somewhat outgrew itself as the province progressed, and it had to be modified. Mr. Rowland Hill, the secretary to the Board of Colonisation committee, put his finger on the weak spot of the Wakefield theory, as a theory. "There is an essential difficulty," said Mr. Hill, "namely, the necessity for selling land, or doing that which is equivalent to the sale of land, which no one knows anything about." The Act of Parliament provided that a minimum of £35,000 had to be raised by land sales, and, like many other principles, the great difficulty about that put forward by Mr. Wakefield was in its practical application. His system was a splendid inspiration for the orator, while the enthusiasm of the British taxpayer was thoroughly aroused in a scheme of colonisation which represented neither expense nor risk for him. But the map of South Australia was a blank. The commissioners knew nothing about the country, quality of soil, or climate. It is not surprising, therefore, that 18 months after King William had assented to the Act, 102 land orders out of a total of 347 remained unsold. A crisis was reached which threatened to nip in the bud the new method of settling distant portions of the Empire.

A. Colonisation Company. At this critical period Mr. George Fife Angas, a member of the Board of Commissioners, came to the rescue. It was his creative brain that outlined the basis upon which the South Australian Company was founded; it was because of his faith in his own plans that that company was established, and the province of South Australia emerged from the nebulous stage and became a reality.



MR. GEORGE FIFE ANGAS.

In his Herculean efforts to make a success of the colonisation scheme Mr. Angas kept five leading principles in the foreground:—(1) The exclusion of convicts; (2) the concentration of the settlers; (3) the taking out of persons of capital and intelligence, and especially men of piety; (4) the emigration of young couples of good character; (5) free trade, free government, and freedom in matters of religion.

Thus was the way made clear for the practical work of colonisation. The first ships were soon on the berth, and with their departure the province of South Australia was successfully launched. "A free country for independent liberty-loving people." That, in effect, was the alluring promise held out. That in reality was the corner-stone of the foundation of South Australia, upon which a great structure is still in course of building. The new province when it first saw the light was free from any "birth-stain." It has continued clean ever since. The Act of establishment said:—"That no person or persons convicted in any Court of Justice in Great Britain or Ireland, or elsewhere, shall at any time, or under any circumstances, be transported as a convict to any place within the limits hereinbefore described."

Trial by Jury. The leading principles of the legislation which authorised the settlement were that South Australia should not be a charge upon Great Britain ; that no convicts should be transported ; and no State church established. An attempt to violate the latter principle a few years later was warmly and successfully resisted. The province was also favored with trial by jury from the outset, the full right of which privilege it had been found necessary to withhold in neighboring colonies. The first court of gaol delivery was held as far back as May 13th, 1837. The presiding judge (Sir J. W. Jeffcott) was subsequently drowned at the mouth of the Murray. In his address to South Australia's first jury, His Honor congratulated the free inhabitants of the province in being able to claim as their birthright that most valuable privilege of the British Constitution—trial by jury. The judge went on to say :—"The only obstacle which seemed at first sight to interpose itself was the presumed difficulty of procuring in so new a colony a sufficient number of intelligent gentlemen to take upon them the highly important duties which you will have to discharge. That difficulty was, however, at once obviated in my mind after I had been a few days amongst you, and I had seen and conversed with the very many respectable colonists whom I had had the pleasure of meeting in private society, and amongst the many interesting and novel features which the formation of the colony presents it is not the least interesting that, within four months of the landing of the Governor and the first colonists on these shores—shores hitherto untrodden by the foot of civilised man—there were found the means of assembling together a number of gentlemen capable of constituting a grand and petit jury, who, in point of intelligence and respectability are, I will venture to say, not inferior to any similar body seen in the mother country." That of itself constitutes a remarkable tribute to the character of the early settlers—a testimony which the pioneers justified in every particular.

The Proclamation.

Captain Hindmarsh, R. N., was gazetted Governor of the new province of South Australia on February 4th, 1836. A month later the *Cygnet*, 239 tons, left London, having on board Mr. (afterwards Sir George) Kingston, Captain Lipson, R.N., Dr. Wright, surgeon ; Messrs. Finniss, Neale, Symonds, Hardy, and Cannan, surveyors ; Mr. T. Gilbert, storekeeper ; Mr. John Morphett, and a number of passengers. The *Rapid*, 136 tons, with Colonel Light, left some weeks after the *Cygnet*, but arrived at Kangaroo Island nearly a month before that vessel. Colonel Light, as Surveyor-General, with an energy characteristic of him, at once began his great work of finding a suitable site for the capital, choosing a place for the chief seaport, surveying the country, and starting to fill up a blank map. The process is still going on. South Australia has unknown fields to be explored, vast tracts of country to be occupied, so that splendid opportunities are offered for courageous enterprising men seeking homes in a comparatively new land.



SIR JOHN HINDMARSH, R.N.,
First Governor of South Australia.



The *Buffalo*, with His Excellency Captain Hindmarsh on board, dropped anchor in Holdfast Bay on December 28th, 1836. The Governor landed the same day, and under the generous shade of gumtrees close to the beach the Union Jack was hoisted, the proclamation read, salutes fired, and South Australia officially started on its course. The following is a facsimile of the historic document.



PROCLAMATION

By His Excellency JOHN HINDMARSH, Knight of the Royal Hanoverian
Guelphic Order, Governor and Commander-in-Chief of

HIS MAJESTY'S PROVINCE
OF
SOUTH AUSTRALIA.

In announcing to the COLONISTS of HIS MAJESTY'S PROVINCE OF SOUTH AUSTRALIA the establishment of the Government, I hereby call upon them to conduct themselves on all occasions with order and quietness, duly to respect the laws, and by a course of industry and sobriety, by the practice of sound morality and a strict observance of the Ordinances of Religion, to prove themselves worthy to be FOUNDERS of a great and free Colony.

It is also, at this time especially, my duty to apprise the Colonists of my resolution to take every lawful means for extending the same protection to the NATIVE POPULATION as to the rest of His Majesty's Subjects, and of my firm determination to punish with exemplary severity all acts of violence or injustice which may in any manner be practised or attempted against the NATIVES, who are to be considered as much under the Safeguard of the law as the Colonists themselves, and equally entitled to the privileges of British Subjects. I trust, therefore, with confidence to the exercise of moderation and forbearance by all Classes in their intercourse with the NATIVE INHABITANTS, and that they will omit no opportunity of assisting me to fulfil His Majesty's most gracious and benevolent intentions towards them by promoting their advancement in civilization, and ultimately, under the blessing of Divine Providence, their conversion to the Christian Faith.

By His Excellency's Command,

ROBERT GOUGER, Colonial Secretary.

Glenelg, 28th December, 1836.

GOD SAVE THE KING.

GLENELG: Printed by authority by ROBERT THOMAS AND Co.,
Government Printers.

"The commission was read," wrote an eye-witness of the proceedings, "to the settlers, of whom about 200 were present. . . . The health of 'His Majesty,' 'The Governor,' 'Officers,' and 'Success to South Australia,' were given and drunk with great enthusiasm. Our National Anthem, combined with the circumstances in which it was sung, had more grandeur in its simplicity than those who only hear it at a theatre can conceive." The progress of the State is well illustrated by the contrast presented every Commemoration Day to what must have been the scene when Governor Hindmarsh read his commission.

The boundaries of the colony at this time were comprised between the 132nd and 141st degrees of east longitude, and between the Southern Ocean and 26th degree of south latitude. The territory of the province amounted to nearly 300,000 square miles, or 192,000,000 acres, including Kangaroo Island, which contains 2,500,000 acres. In 1861 80,000 square miles of land between the western boundary of South Australia and the eastern boundary of Western Australia—a tract of country then known as No Man's Land—was added, and the western boundary is now the 129th degree of east longitude. In 1863 the boundaries were further extended by the addition of what is known as "The Northern Territory," which consists of the country stretching northward from the 26th degree of south latitude to the Indian Ocean, and lying between the 129th and 138th degrees of east longitude. South Australia, therefore, now extends from the Southern to the Indian Ocean, and contains an area of 903,690 square miles, or 578,361,600 acres.

It was not to be expected that the heterogeneous company dumped on the shores of an unknown land would work out their destiny without friction. There were naval officers who had fought under Nelson, accustomed to prompt obedience without questions being asked; soldiers who had been through the Peninsular wars and at Waterloo with Wellington; men with money, and men without money, each possessing strong individuality and a large supply of human nature. Governor Hindmarsh was a warm-hearted bluff sailor, who had served under Nelson, at whose hands he had the honor to receive a presentation sword, accompanied by high compliments for gallant conduct. He combined all the strength of the average naval officer to give orders with the weakness of the average sailor to administer civil affairs and bear with the failings of an undisciplined public. He wanted his own way over the site of the capital, and lost his temper when opposed by a gallant soldier who had won distinction under the Iron Duke. The Governor appealed to the Home authorities, but was informed that "when he applied for the office of Governor he was distinctly informed that the right of selecting the capital would be vested solely in the Surveyor-General." The little community ranged itself into two hostile camps, and a fierce wordy war took place over the site of the capital. In the preface of his "Journal of Proceedings," published in Adelaide in 1839, Colonel Light wrote:—"The reasons that led me to fix Adelaide where it is I do not expect to be generally understood or calmly judged of at present. My enemies, however, by disputing their validity in every particular, have done me the good service of fixing the whole of the responsibility upon me. I am perfectly willing to bear it; and I leave to posterity, and not to them, to decide whether I am entitled to praise or blame." When Colonel Light won the day it seemed as if all his fellow-colonists were bent on justifying the theory of the great German philosopher, that so soon as a man does anything remarkable "there is a general conspiracy to prevent him doing it again." Colonel Light was worried into an early grave, and if his wishes as a man of retiring disposition were that he and his work might be speedily forgotten, those wishes for a time were singularly respected. Time has vindicated him and the work he did. Efforts were made at various periods to erect a substantial memorial to perpetuate the memory of the man who fixed the site and laid out the capital of South Australia. Possibly a feeling that no such emblem was needed partly explains why nothing was done for many years. Even the modest monument at his grave was permitted to crumble away. "If you seek his monument, look around you," was after all the most enduring reminder the fortunate dweller in the cleanest and most beautiful city in the Commonwealth was able to convey to the visitor. In 1906 a fine bronze statue was erected in Victoria Square to the memory of the founder of Adelaide, and by this act citizens removed the reproach that had previously rested on them of having failed to publicly recognise the services of Colonel Light.



Statue of Colonel Light, the Founder of Adelaide.

[Gasard, Photo.]

The Pioneer as Pathfinder.

"What a land is this to which you have sent me! The loveliness and glory of its plains and woods, its glens and hills! But of these you will hear from others. I cannot, however, leave it out of my estimate of God's goodness to me, that He has placed me in so fair and sweet a portion of His earth." So wrote the Rev. T. Q. Stow to the Colonial Missionary Society. A keynote of gratitude was struck by many others, who described in glowing terms the beauty of the new land.

The "Pilgrim Father" type was well represented among the early settlers. They were "self-selected" colonists—men who felt that they were hampered in the homeland. Pride of race was a dominant characteristic, but stronger still was their love of liberty. They possessed



King William Street, at Junction of North Terrace.—Unveiling the National Memorial Erected to the Memory of South Australians who Fell in the Boer War, South Africa.

[Gusard, Photo.]

physical and moral courage to an unusual degree, cool determination in the face of all difficulties. Troubles soon began, but the pioneers emerged triumphant and made substantial progress when once initial difficulties were overcome. For many months the first settlers had been huddled together on small vessels lacking in everything that helps to modify the discomforts of a long sea voyage. When the landing took place on the shores of Holdfast Bay each family had to shift for itself. Some had tents, others had to imitate the natives and build bough wurlies. When a move was made to the spot where the city of Adelaide is situated, women and children had to walk and carry as much of their household furniture as they could. The men placed the balance on wheelbarrows, which they had to push through five or six miles of scrub. Then came the "reed hut period." Houses of all shapes and sizes were made from reeds growing in the River Torrens, and for some time colonists clustered together, making occasional excursions back to the landing-place, or down to where Colonel Light had decided

the chief seaport of the new province should be established. The time soon arrived when the practical work of colonisation with all its accompanying privations had to be faced. When it came there was ready as fine a band of stalwart men and noble women as ever set out to subdue a wilderness or wrest from Nature her choicest gifts. As the pioneers pushed out into the country they caused the sunlight to break through the dark clouds which by this time hung like a pall over the little city of reed huts erected on the banks of the Torrens. The crack of the bullock-driver's whip as he turned his leaders northwards, the music of the axe as roadways were made through the bush, stirred the colonists to fresh activity and filled them with new hopes. The advance guards of civilisation moved outwards from the new centre of settlement, and the subjugation of South Australia began. The hardships endured, the failures



View of a Portion of the City of Adelaide, Mount Lofty Ranges in the Distance.

which came in place of success, only served to prove the mettle of the sturdy people who so well and truly laid the corner-stone of a great structure, which at the end of 66 years typifies national progress and prosperity. The hottest day was not too hot, the longest journey not too long, the bush was not too dense, nor the hill too steep for the men and women who had turned their backs on the newborn city. The Pathfinders for posterity moved out toward the unknown to conquer the bush, bridge the ford, and pave the way for their children and their children's children. By unremitting toil, with primitive appliances, backed by rare patience and endurance, they created the magnificent heritage which is ours to-day. Their sons and daughters have well maintained the family reputation. Nowhere in the British Dominions is a better stamp of colonists to be found than in South Australia. The work of subduing the wilds continues, but with greater vigor and more systematically than in the early days. Growth is sometimes checked, but the movement is ever outward. The stockman, the miner, the farmer, seek fresh victories out in the heart of our great continent, where there is almost unlimited room for expansion. Central Australia possesses a vast treasury of wealth awaiting exploitation by capital and labor. The pioneers have made the way easy and safe for those who

come after them. Roads cross and recross one another, forming a perfect network of communication. From Adelaide to Port Darwin there stretches a telegraph wire—the first connecting link between the old world and the new. Railways have been built and rivers bridged. Newcomers have but to enter and take advantage of the splendid self-denying labors of the early settlers.



South Australia is a "Land of the Vine."—Vineyard and Cellars, near Adelaide.





(CH IV.) A ROADSIDE BEAUTY SPOT NEAR ADELAIDE: A FAVORITE RESORT FOR TOURISTS.

CHAPTER IV.

SOUTH AUSTRALIA AS A FIELD FOR SETTLERS AND TOURISTS.

THE State of South Australia recently passed the allotted span of human life, having celebrated the seventy-first anniversary of its birth on December 28th, 1907. The years have been full of activity, resulting in substantial progress in every direction. In three-quarters of a century the wilderness has been explored and subdued, bridges and railways built, homes made under skies as blue as Italy's, civilisation advanced, and the Empire, of which the State is an important outpost, made more secure. No other 400,000 people on the globe to-day are more prosperous, happier, or more hopeful than are the favored citizens of the Central State of the Commonwealth.

Established by free, independent, sturdy, and resolute colonists—men
A Land of and women from good British stock—South Australia forged ahead from
Contrasts. the first, until its record of progress is one of continuous expansion. The
object of this book is to tell the story of the settlement of that portion of
the great Southland known as "South Australia," to recall some of the trials and triumphs
of the pioneers, but above all to show how wonderful has been the growth of rural industries,



On the Hindmarsh River, near Victor Harbor: a Popular Tourist Resort.

[A. E. Summers, Photo.]

and how marvellous are the resources yet to be developed in this land of alluring contrasts—a land of golden fleece and golden grain, of luscious fruit and choice wine, of orange groves and apple orchards, of gold, silver, and copper; a land of sunshine, where the climate is healthy and invigorating; a land of extended horizons and great distances, wherein the highest ideals of civilisation may be realised by a free, independent, and happy people.



Elder Park and Torrens Lake, within the City, where Band Concerts are given from a Rotunda.

[Gazard, Photo.]

If the intending settler or the tourist, anxious to become acquainted with the "Antipodes," will study the map, he will at once realise the strength of South Australia's geographical position. The law of latitude has been described as the "Law of God," in so far as latitude determines climate and climate regulates production. A country that stretches north and south through the heart of the largest island continent of the world must necessarily possess more than one weather zone, and a corresponding variety of resources. South Australia connects with Victoria, New South Wales, and Queensland on the east, while its western border touches Western Australia from sea to sea—from the Southern Ocean to the Indian Ocean.



King William Road, looking North towards the Anglican Cathedral and North Adelaide.

[Gazard, Photo.]



THE TOURIST'S INTRODUCTION TO THE CITY.—THE ADELAIDE RAILWAY STATION.

A Cheap Voyage.

The palatial mail steamers which supply a weekly service between Australia and England land mails and passengers for Eastern Australia and New Zealand at South Australia's chief port, and embark mails and passengers on the return voyage. A commodious "Outer Harbor" has been constructed for the accommodation of ocean-going vessels, and passengers are able to step from the deck of their steamer into a train which will land them in Adelaide in 20 minutes.

Through passengers to and from the Eastern States are thus provided with every opportunity for breaking their journey and spending a few days, or weeks, in visiting rural South Australia, and the numerous beauty spots and pleasure resorts which the State supplies. All the big liners trading to the Commonwealth call at South Australia, so that the immigrant or the tourist has a variety of fares from which to make a choice. The voyage may be made *via* the Suez



Scene on the River Murray, which Flows through South Australian Territory for a Distance of over 500 Miles.

[Dr. W. Ramsay Smith, Photo.]

Canal or the Cape of Good Hope, and the alternative offers a remarkable contrast to the experiences which early settlers were compelled to undergo. The journey may now be accomplished in a few weeks, with a minimum of risk and a maximum of comfort and enjoyment, in steamers that are scheduled to time with the certainty of railway trains.

First Impressions.

The tourist from the deck of a steamer coming up St. Vincent's Gulf cannot fail to admire the magnificent panorama of landscape spread out before him. A high range of hills, running north and south, shuts off the eastern view and concentrates the vision on the plains situated on which, close to the foothills, is Adelaide, the capital of the State. The country is open and undulating, rising in easy gradients from the seashore to the mountains. Cultivated fields give the country a chess-board appearance, vineyards alternating with cereal and irrigated fodder crops; grass meadows contrasting with the chocolate color of the fallow land. The tourist receives a favorable impression as he approaches the harbor, and cannot fail to come to the conclusion that the lowlands and the highlands near Adelaide will repay closer inspection.

Adelaide the "Queen City of the South."

A fertile plain, bounded to the south and east by a circling range of softly rounded hills, separated by a succession of verdant valleys; on the west fringed by the waters of St. Vincent's Gulf; while northward the plain loses itself in a series of undulations merging in the dark blue of the horizon. Such is the site of Adelaide, the best laid-out and cleanest city of the Commonwealth, justly designated the "Queen City of the South." Dr. Parkin, the representative of the trustees of Cecil Rhodes, said he considered Adelaide "one of the most beautiful and one of the most highly favored cities he had seen in all his travels." Mr. Peter Barr, the "Daffodil King," was charmed with the beautiful squares in the heart of the city and the extent of the park lands which surround it. Another distinguished visitor declared that the capital of South Australia "presents an aspect of substantial comfort and solid opulence which is not equalled by English cities counting as many generations of existence as Adelaide does years." Said a



River Murray.—Passenger Steamer.

[Dr. W. Ramsay Smith, Photo.]

world-travelled American journalist recently :—"Adelaide is the prettiest city of the Commonwealth. The gardens and parks are beautiful, the city is well kept and clean, and your climate is just perfect. From choice I would sooner make my home in South Australia than any place I have ever visited." South Australians are justly proud of their Botanical and Zoological Gardens, and the visitor to the city ought not to fail paying both a visit.

Mountain Scenery.

One hour's railway journey along the foothills, then zig-zagging among high ranges, now through a long tunnel, now over a viaduct bridging a deep ravine, takes the visitor from the lowlands to the highlands which form so picturesque a background for the city of Adelaide. Glimpses of a fertile plain stretching far to the south along the coast, a bird's eye view of the blue waters of the gulf, and then from the summit of the Mount Lofty group of hills the tourist is favored with a panorama of undulating country towards Mount Barker and beyond to Lakes Alexandrina and Albert and the River Murray—the "Nile" of Australia. This is one of the finest railway

trips to be had in Australia. The visitor has nature's choicest gifts lavished upon him. The train dashes through tunnel after tunnel, skirts along a canyon, and winds its way upward to high altitudes. In their season may be seen forests of golden-decked, sweetly-perfumed wattle, the national flower—emblem of Australia, well-laden apple orchards, or acres of luscious strawberries. Terraces of gardens, mansions erected by successful colonists, and strips of country in natural wild state add variety to an excursion which is unequalled for beauty. These hills may be reached by a number of roads leading from the city. Motoring or driving through the ranges provides a delightful outing.

Views of A representative of the Canadian Pacific Railway, after a visit to these
Visitors. hills, said :—"I had a drive through the suburbs and the Mount Lofty Ranges on Sunday, and it was a perfect revelation to me—a revelation, indeed, in a world's tour. The profusion of blossoms in the orchard lands was particularly striking, and the roses in the suburbs would have delighted the hearts



View in Botanic Gardens, Adelaide.

of thousands of Canadian ladies. You must remember that we in Canada do not understand the floral kingdom as you do in Australia. It is a common thing for a lady to pay as much as 25 cents (1s.) per rose for a ballroom decoration, and to see that flower growing in the profusion that was permitted to me on Sunday was indeed a reason why Adelaide and its environments should be placed before the people of a country who see such flowers at their best for only two months in a year. For you who have grown up with these floral charms my point may appear an empty one, but there is real attraction in such conditions, suburban to Adelaide, for people who are used to a rigorous winter climate. I say unhesitatingly that there is money for my company and for your tradespeople and railways in the suburban beauties of Adelaide. The orchard lands which I had a sight of on Sunday were more than satisfying. I think I liked them even better than the rose boweries. There is nothing like them in California or Florida. The cherry blooms looked more like snow than blossoms. I have never seen fruit trees so

attractive, and, hot as the day was, I enjoyed the drive immensely. South Australia ought to be reaping a rich tourist revenue, but it really does not appreciate its potentialities in this connection. The scenery here is so delightfully different in comparison with what Canadian people are used to that I am sure only advertising in the proper quarter is needed to open the desired influx into Australasia."

Mark Twain, in "More Tramps Abroad," says:—"Approaching Adelaide from Melbourne we left the train and were driven in an open carriage over the hills and along their slopes to the city. It was an excursion of an hour or two, and the charm of it could not be overstated. The road wound around through gaps and gorges and offered all varieties of scenery and prospect—mountains, crags, country houses, gardens, forests—color, color, color everywhere, and the air fine and fresh, the skies blue, and not a shred of cloud to mar the downpour of the brilliant sunshine. And finally the mountain gateway opened, and the immense plain lay spread out



Victor Harbor: a Popular Seaside Resort.

[McGann, Photo.]

below and stretching away into dim distances on every hand, soft and delicate, and dainty and beautiful. On its near edge reposed the city; with wide streets, compactly built; with fine homes everywhere, embowered in foliage and flowers; and with imposing masses of public buildings nobly grouped and architecturally beautiful."

Mr. Michael Davitt, Member of the House of Commons, in his book "Australasia," wrote:—"The drive from Adelaide to Mount Lofty is ideal in almost everything that can render a drive truly pleasurable"; and he continues—"The many-sided hospitality of this charming city always includes this treat when strangers from 'the old countries' are fortunate enough to find themselves in Adelaide; and full as Australasia is of the choicest work of Nature's handicraft in scenery, the visitor to Mount Lofty, if he has an eye and a soul that can attune themselves to the beautiful in landscape and in sea view, will never forget or regret such an experience. Right and left of the zigzag road, on to the top of the range, you pass deep and verdant valleys that remind you of the greenest of Wicklow's vales. Vineyards and fruit gardens are seen on

every hand, with pretty villas and cosy-looking cottages perched on places from whence the finest prospects are to be commanded of the fruitful plains beneath the hills, and of the coastline midway between you and the sea-bounded horizon. The view from Mount Lofty, looking down upon Adelaide, the plains and the seacoast, is a delightfully varied one. Midway between you and St. Vincent's Gulf lies the City, extending out over the rich plains which stretch from Cape Jervis (away some 20 or 30 miles to the left) on to the right, as far as the eye can reach northwards. Adelaide looks surprisingly large for a place with a population of 165,000; a circumstance due to the excellent planning of wide streets and of the spreading-out-into-the-country ideas which form so rational and healthful a contrast with the cramped and cooped-up ugliness and discomfort of most old country towns and cities. The trees in and around the capital lend a special charm to the picture of urban beauty lying below you. A city cannot be handsome without trees. It is in this respect where Adelaide 'catches the eye' more than either Melbourne or Sydney. Richly-cultivated fields, gardens, orchards, and vineyards lie



Cliffs, Alligator Creek, near Wilmington.

[E. J. Tuckwell, Photo.]

on every hand around Adelaide, and give you the impression of a country as fruitful as it is pleasant to look upon. With a sky as cloudless as I ever saw above the Bay of Naples, together with the combined attractions of sea and city and plain, I have seldom gazed upon a more captivating or more comforting panorama of landscape views, combined with the evidences of potential prosperity all round, than from the top of Mount Lofty."

Mr. Frank T. Bullen, author and lecturer, in his "Advance Australasia," says:—"All the roads in the city are just perfect to ride on, either in buggy or motor, on a bicycle, or to walk on, so splendidly graded and beautifully kept is the asphalt of which they are composed. It is an object lesson, patent to the most casual eye, of the character of the people, this wonderful care of the roads. Of all the cities that I have ever seen Adelaide comes easily first in the perfect beauty of its situation and arrangement. Level it is, certainly, yet not nearly so level as it appears from the hills, with a lavish width of roadway, even in what would in other places be mean streets, and beyond all the magnificent belt of park lands which environ it, set aside for the health and enjoyment of its citizens as long as it shall be a city by wise

far-seeing old Colonel Light, bitterly as he was reviled at the time for making such a selection of a site for the capital of the new colony. But it is not until the visitor has been taken in hand by some hospitable citizen and, seated in a motor car, has been whirled away by winding roads through lovely scenery up the beautiful flanks of Mount Lofty, that he recognises what a wonderfully handsome and ideally situated city it is. And there is a quiet exultation about those same citizens as, mounting higher and higher, they again and again invite you to survey the panorama beneath you, that is most pleasant to witness. They do not brag, bid you, as they would if they were Yankees, burst into unstinted panegyric, but they wait confidently and quietly for the expression of your honest opinion. And I do not think they are ever disappointed."



Avenue of Cotton Palms at the Renmark Irrigation Colony.

[Frank Wyllie, Photo.]

Where the Saltbush Grows. South Australia is a land of wide horizons, but for the tourist who is on pleasure bent, and has a little time to spare, there are numerous beauty spots and places of great interest that are accessible either by train, steamer, or coach. The State is well supplied with fashionable, as well as secluded, watering places, where cool breezes can be found after the genial warmth of a summer's day. The traveller who yearns for distant fields, and wants to see "life" in the country, can satisfy his tastes at small cost and in comfort. Three easy stages by train in the day time will land him at Oodnadatta, the most northern railway station—at present the "outpost" of what may one day be the great transcontinental line connecting Adelaide and Port Darwin. Such a journey toward the centre of the continent would give the passenger an opportunity of seeing interior Australia—where the saltbush grows.

The tourist has a variety of railway journeys open to him, by means of which he may see many aspects of life in South Australia, but by no means the least pleasurable excursion is the water route which leads inland—the great river system of Australia—providing for several months of the year 3,000 miles of navigable streams. There are many beauty spots, numerous seaside and inland pleasure resorts, but a holiday trip on the rivers offers a variety of sensations and enjoyments. A steamer may be boarded at several points a few hours after leaving the city by train, and a new and ever-changing world is presented to the sightseer. The snorting paddle-boat plugs its way up stream, battling against a slow-moving current. The splish, splash, splish of the paddle-wheels, the sharp clear notes of the whistle, and the flash of the electric headlight break into the stillness of slumbering nature and disturb the dreams of animals and birds. Bird life is plentiful in the forest of giant gum trees which come down to the water's edge, and form an avenue through which the vessel moves. A cliff



The "Water Route to the Interior."—Passenger Steamer "Ellen" Negotiating Queen's Bend, River Murray.

(J. C. Reimers, Photo.)

towers high over the bows of the steamer, but the boat is skilfully turned around a right-angle, which opens out a long reach of shimmering water, at the end of which there is another sharp bend. And so the tourist is taken forward—turning and twisting, first one way and then another, following a serpentine course inland, heading northwards, then face on to a fresh east wind, back again half round the compass; only there are no compasses on these river boats. A steamer does a "cakewalk" when going up the rivers Murray, Darling, or Murrumbidgee. There is plenty of scope for the pleasure-seeker and the sportsman on the "Nile" of Australia. A project is being promoted to construct locks and weirs, by which means these highways will be made navigable all the year round for 3,000 miles—a distance equal to that from Adelaide to Port Darwin across the continent and half-way back again! This system when completed will greatly help in the development of Australia's resources, and will add to the attractions of these great waterways as pleasure resorts and highways of trade.



A WATERFALL IN THE MOUNT LOFTY RANGES, NEAR ADELAIDE.

[McGann, Photo.]

Charm of Climate. South Australia is a land where the country "calls." The searcher after sunshine—the men and women who desire to escape big fuel bills, and live a life of freedom near to Nature's heart—would find ideal conditions in the "Central State" of the Commonwealth. Any variety of weather may be had, for climate is a matter of north and south. A train journey toward one pole or the other will supply perpetual sunshine. The winter of the interior supplies balmy days and cool nights tempered by semi-tropical conditions. In the summer, when the sun is overhead, the heat is dry, and not nearly so enervating as the thermometer readings suggest to strangers. The temperate zone of the southern portion of the State corresponds to that of Italy.

So equable is the climate that it is never necessary to house and artificially feed live stock. The most valuable stud animals, graze in open paddocks from January to December. The



Mountain Scenery in the Mount Lofty Ranges.

[McGinn, Photo.]

fact that medical experts all over the Commonwealth regard South Australia as a sanatorium, and send patients to it to recuperate, is a sufficient testimony to the bracing qualities of the atmosphere.

The State offers ideal homes for retired Indian officers and persons who desire to lead a peaceful rural life, breathing the fresh air of the country under the shade of their own vines and figtrees. The national standard of education is high, so that in city, town, and country there is no lack of intellectual culture or opportunity for bringing up families. Life is free and attractive, and the cost of living comparatively low.

A "Garden" State. South Australia has been described as a "garden" State. A recent English visitor declared—"South Australia is a fine country. Its area is vast, its resources are numerous, and its people capable." An important factor for the worker is that there are no long periods of enforced idleness on account of climatic conditions. Snow does not lie on the ground for weeks at a time: for a snowfall in the ranges once in a few years causes the greatest excitement, and a stampede



A Vineyard of the Foothills, overlooking the "Queen City of the South."

[McGann, Photo.]

of citizens usually takes place to view the strange sight. The farmer can get upon the land and do something at every period of the year, while the horticulturist and the stockowner can profitably utilise all their time. That in itself is an important asset. There cannot be anything wrong with either the soil or the climate of a country in which in the same field may be seen growing in their season apples, oranges, pears, cherries, olives, grapes—the fruits of all



Where the Saltbush Grows.—Camels at Government Well, Farina, Far North.

Europe thriving luxuriantly in the one State. In the next field may be grazing cattle, sheep, and horses that are not to be excelled in any part of the world. Whether it is the genial sunshine, the beauty of the landscape, or the free and happy lives of the people, a fact that has become an adage is—"Once a South Australian, always a South Australian." The native-born who has made his fortune has often said farewell to friends, in order to make his home on the other side of the world. His return in the course of a year or two is certain, and the explanation invariably is—"This is the best country for climate, for the reality of enjoyment, and good living."

Natural conditions favor the primary producer. Cheap land, good soil, favorable climate, increasing transport facilities, improved methods of culture, all combine to reduce cost of production to a minimum. The pastoral, agricultural, and dairying industries are all expanding, and there is a steady growth of manufactures and mining.

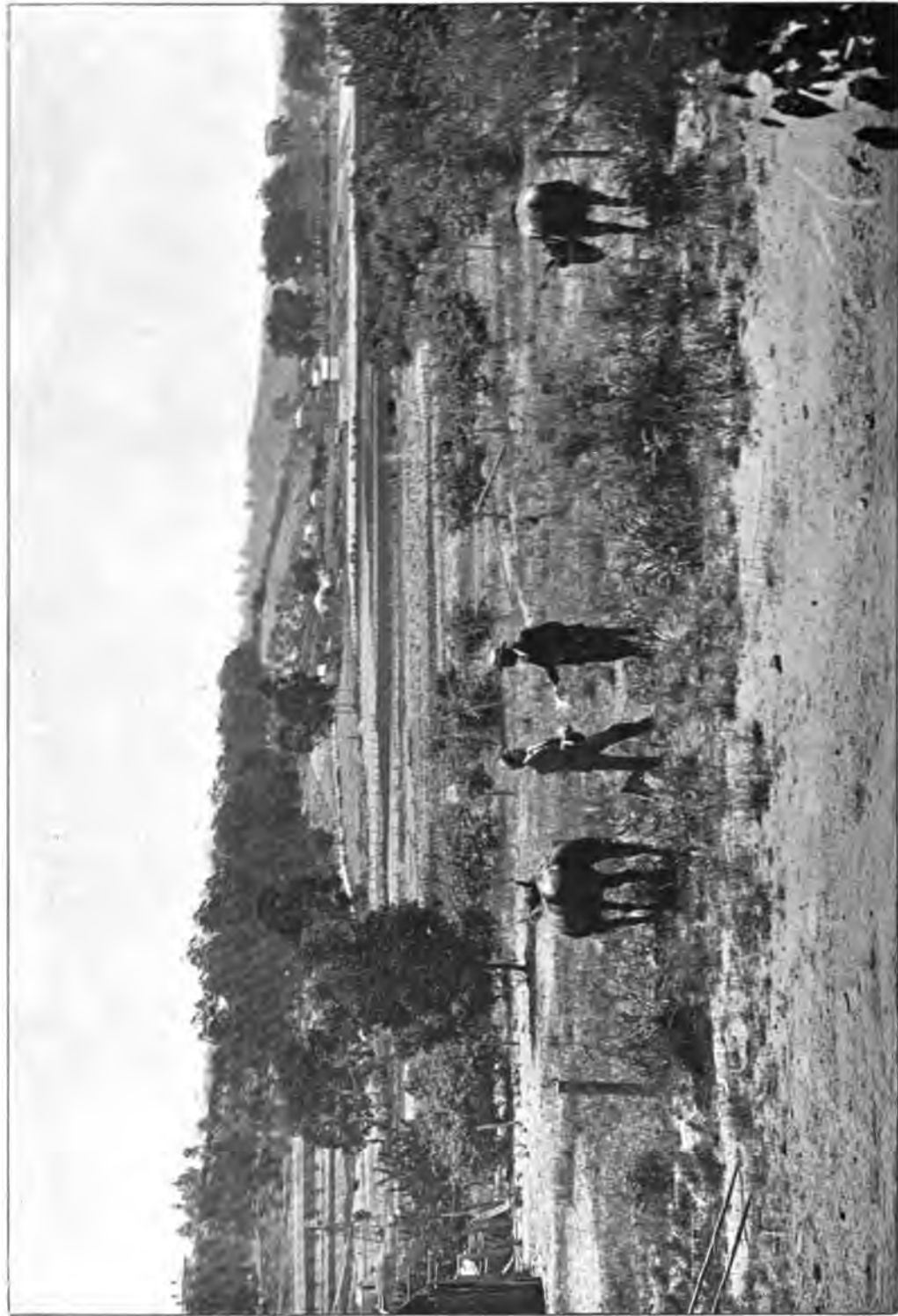
Lord Tennyson, once Governor of this State, and subsequently Governor-General of the Commonwealth, recalled in his address at the "Australian Dinner" in London in 1906 his first sight of Australia's shores:—

It seems but yesterday I saw at dawn
The dim line of the soft Australian shores,
As fast we sped, borne o'er the whispering tide,
Within the grim heads of St. Vincent's Gulf.
And all the sea was barr'd with purple and green
And dazzling sunlight, such as Southern climes
Know only; while afar in distance shone
Thro' tremulous haze the scanty-scattered farms
Hom'd in the quiet hollow of the hills—
A land, they said, of golden air, where scents
Of sweetest flowers float, and where the grapes
In honeyed clusters droop, a paradise
Of glowing blue and tranquil loveliness.



Packing Fruit for Export.

[McGann, Photo.]



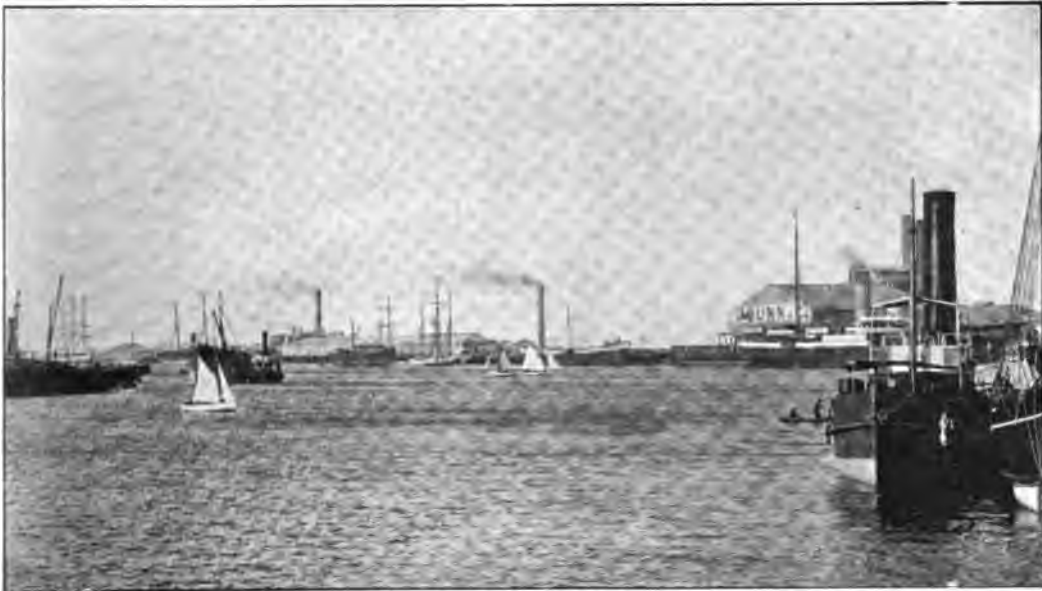
VALLEY SCENE MOUNT LOFTY RANGES.
One of the Finest Scenic Views in Australia.

| W. S. Smith, Photo.

CHAPTER V.

INDUSTRIAL GROWTH AND TRADE.

THE material progress of South Australia has been continuous and substantial. A total population, which at the present time is less than 400,000, has, in a country more than four times the size of France and more than seven times larger than the United Kingdom, subdued the wilderness, conquered the desert, causing it to blossom and become productive. At the end of 70 years there was a population of 385,000 persons; a public revenue of £3,100,000; a combined annual trade—imports and exports—equal to £21,635,000; 1,800 miles of railway have been built; 21,000 miles of telegraph and telephone wires are employed; 3,100,000 acres of land are annually cultivated; 22,575 acres are under vines; there are over 6,624,000 sheep, 325,000 cattle, and 206,000 horses in the State, whilst the staple export trade amounts to £7,440,000, and has aggregated in the 70 years £185,343,350.



A Portion of the Harbor at Port Adelaide, the Chief Shipping Port of the State.

[McGann, Photo.]

Even this record of industrial expansion—splendid though it is—does not convey an adequate idea of the work accomplished in colonising and developing so vast a territory. When Governor Hindmarsh read the proclamation in 1836 there was a handful of colonists present, and they had not begun to make history in the new country. Not an acre of land had been disturbed, roads and buildings were unknown, and expenditure was the only item entered in the national ledger. The outflow of public money so exceeded income for a few years that financial chaos resulted. A vice-regal representative was made the scapegoat. At this distance we can afford to regard the perilous period referred to as a “mere incident” in colonisation, a phase through which nations pass and are all the better for the experience. The fiercer the

furnace the finer the quality of the steel. Not since those strenuous days of the early forties have colonists ever had cause to question the security of a Government promissory note or doubt the future.

In "Letters from Victorian Pioneers," Mr. Thomas Chirnside says that he arrived in Adelaide in 1839, and visited "the most remote station," 30 miles from Adelaide! He was "surprised to find parties of such a speculative spirit raising the price of land by false capital to a fictitious value, and paying for the same with long-dated bills." Mr. Chirnside bought cattle in Sydney and travelled them to Adelaide, where, on his arrival he found the price had fallen from £20 to £7, at which price he sold, and took bills. "In Adelaide," he wrote, "there appears to be a spirit of Yankeeism; while in Sydney the people are light, gay, and thoughtless."



A Rural Scene in South Australia.—Picking Grapes for Wine-making.

[McGann, Photo.]

In 1841 there was a deficiency in the accounts of nearly £300,000, and bills drawn by Governor Gawler upon the Imperial Government were dishonored. The effect of this was to stop all public works, dislocate trade, and throw a number of persons out of employment. It is the first recorded unemployed trouble in the State.

At a special meeting of the Adelaide Chamber of Commerce, held on April 28th, 1841 with Mr. W. Giles in the chair, the following resolution was unanimously carried:—"That this meeting regards the present financial position of the colony, arising from the dishonor of the bills drawn by His Excellency Colonel Gawler on the Colonisation Commissioners, with the deepest regret, and at the same time expresses the fullest conviction that these bills will be eventually paid; that, confident in the stability and resources of the colony, this meeting is persuaded that the pressure resulting from these circumstances, and that which may be anticipated from the diminution of the current expenditure, will be but of temporary duration,

provided that mutual confidence and forbearance be exercised by the commercial community." The chamber further resolved that should the Governor see fit to draw on the Treasury they would accept such bills in payment for their ordinary business transactions.

The check was not of long duration, for a few years later discoveries were made of rich copper deposits, and the new settlement began to forge ahead on the high road toward prosperity. Within a very little time the public income was more than sufficient to cover all outgoings. In three years the revenue more than doubled itself. The pastoral industry was rapidly expanding, agriculture was extending, mining was in a buoyant condition. A reaction set in early in the fifties, when gold discoveries were made in Victoria. This threatened to produce disastrous results to the province then entering upon its fifteenth year. The male population stampeded to the goldfields. By bullock dray, by pack horses, in traps, on foot, by sailing vessels—which sometimes occupied as many days on the voyage as it now takes the mail steamers hours to cover the same distance—there was a steady outflow of humanity, until only women and children remained. There was no labor available to gather the crops as they ripened, and the natives had to be called upon to help the harvesters. Work was ever a stranger to the average Australian aborigine, and the blacks proved poor substitutes for the pale-faced settlers,



Wealth from the Land.—Heading Hay.

now turned diggers. "Necessity" had again proved the "mother of invention." With ripe corn wasting in the fields for want of laborers, Mr. Ridley conceived the idea of the stripper, an implement which has had a remarkable evolution and proved of incalculable benefit to the agricultural industry in Australia. South Australian strippers, vastly improved on Mr. Ridley's model, are to be found in all parts of Australia and in the Argentine Republic.

The critical period through which South Australia passed during the height of the gold fever was forcibly indicated in the second annual report of the Chamber of Commerce, dated 1852, in which the following remarks occur:—"For a time it seemed that the props of our material prosperity were about to give way. The streets of Adelaide were deserted, houses were abandoned by their tenants, rents fell, and property became unmarketable. The shops of our retailers presented their tempting wares in vain. There was a general arrest put on all business; and this at a time when the stock of merchandise in the market was unprecedentedly heavy, and when the bill engagements of the mercantile community were larger probably than they had ever been before. At this juncture, as if to mark with greater emphasis the signs of the times, a vessel arrived at Port Adelaide from Melbourne with a number of colonists on board who, after a few weeks' successful digging at the goldfields of Victoria, brought back with them to this colony gold dust to the value of £50,000. This they were desirous of converting

into money, but such was the straightened condition of the money market that purchasers could not be found for it. A portion of it was eventually sold at £2 15s. to £2 16s. per ounce, the price at Melbourne being £3 at the time, and the remainder was carried back to Victoria. Such a circumstance was quite sufficient to show the critical position into which the colony had been thrown. It was, therefore, desirable by every possible means to attract back again with their gains as many of the absentee colonists as could be induced to come, in order that their wealth might be rendered available for the general good. But an unexpected difficulty had to be encountered. The successful digger could not sell his gold if he brought it back, there being no money in the colony with which to purchase it. At one time the coffers in the Treasury were empty, and the civil servants had not received any pay for three months.

"It was at this time, when ruin was staring everyone in the face, and when there had already been unmistakable symptoms of an approaching run on one of the banks, that the committee of the Chamber of Commerce held a conference with the managers of the three banking institutions with reference to the measures to be adopted to meet the appalling crisis. At this meeting the difficulties of our position were fully discussed. The radical cause of the extreme financial embarrassment which existed was acknowledged to be the sudden and uncontrollable efflux of specie, which was gradually contracting the circulation into dimensions



Developing the Interior.—Camel Teams Loaded with Fencing Posts at Farina, in the Far North.

totally inadequate to meet the wants of the community. It was considered, if the banks were permitted by law to base their issues for a time on uncoined gold at such a price as would leave a safe margin for the transmission of the gold to England and its replacement in coin, that perfect security would be offered to the public, and a palliation, if not a complete corrective, presented to the disorder which prevailed. It was perceived that such a measure, if devised, would enable the banks to afford the required banking accommodation to their customers, so that every really solvent man should have an opportunity of retrieving his position. It was anticipated that a currency so free, and yet so legitimate, would create a market for the raw gold; and that thus—which was a much more coveted desideratum—the gold-digger of South Australia would be laid under inducements to return with his auriferous treasure to this colony. It was unanimously held that we were shut up to the line of policy here indicated if we would preserve the colony from general bankruptcy and avert a catastrophe which threatened to engulf all our colonial interests, for a time at least, in overwhelming confusion. To embody these views in some definite shape it was resolved that the chamber, in conjunction with the banks, should make an urgent application to the Government to establish an assay office for the purpose of assaying and converting gold into stamped ingots, to be exchanged with the banks for their notes. Such was the crude form of a scheme which ultimately resolved itself into the Bullion Act.

"The representatives of the mercantile and banking interests—with the exception of the manager of the Bank of Australasia (the late Samuel Tomkinson), who dissented from this proposal, and would not agree to take ingots of gold as a legal tender—immediately petitioned the Lieutenant-Governor, Sir Henry Young, to convene the Legislative Council for the purpose of taking into consideration these proposals for the relief of the colony. At once responding to the general desire, Sir Henry issued a summons for the Council to meet on the 28th of January, 1852. The welfare of the colony was in their hands. It was an anxious time for the members, as they were called upon to make a daring innovation on established rules and principles; but the Council nobly did their duty, and with but few amendments the Government ordinance was passed, and in time became law.

"And here it is only an act of justice to the Lieutenant-Governor to acknowledge the obligation under which he has laid the colonists for having, at considerable responsibility, although at their unanimous desire, affixed the royal sanction to a measure which, however imperatively called for and however beneficial in its operation, is apt to be looked upon with



Along a Country Road.

[C. J. Tuckwell, Photo.]

suspicion or aversion at a distance, where the peculiar circumstances which rendered it necessary, however forcibly described, can be faintly appreciated. Such an act on his part was a graceful concession to the popular will, as expressed in one of its most intelligent forms, and as such is calculated to strengthen the good understanding which ought to subsist betwixt the Government and the people."

Tapping Resources. These were exciting and critical times for South Australia, but they soon passed away. As the gold seekers began to return home the wave of depression receded even more rapidly than it had approached. Many of the adventurers came back with considerable quantities of gold to their credit in the banks. Inspector Tolmer had established his famous escort, and the much-needed yellow metal, as well as miners, flowed back to South Australia. An era of increased activity in all branches of industry began. The land office was once more besieged by applicants wanting broad acres, and sales of land jumped from £32,000 in 1848 to £383,000, and the public revenue from all sources stood at £595,000 in 1854. Between September, 1852, and January, 1853, £17,000 of gold from the Echunga fields was purchased in Adelaide. By

1851 imports from Great Britain had aggregated £3,000,000. Two years later they had increased to £5,000,000. It was during the successful regime of Governor Young that the River Murray was opened to navigation. Sir Henry was a firm believer in the Murray as a highway of trade to the interior, and it was largely due to his splendid enthusiasm that navigation was inaugurated and the possibilities of that noble stream adequately recognised. Captain Cadell had come down stream in a canvas boat, and Captain Wm. Randell, who is still alive, was engaged building a small steamer at Mannum. Captain Randell's boat, the *Mary Ann*, was actually the first vessel to steam up the Murray, but the *Lady Augusta*, brought around from Sydney by Captain Cadell, fulfilled the conditions which accompanied the Parliamentary offer of a bonus. Thus the reward of £4,000 went to Captain Cadell. Governor and Lady Young and party accompanied Captain Cadell on the first voyage of the *Lady Augusta*. At times the Murray and Darling are navigable for a distance of 3,000 miles, and, despite the combined efforts of various States to tap by railways the legitimate river trade, the waterway continues to be the cheapest means of transit for a large number of producers. In years of average rainfall the river more than holds its own against land carriage.

The forties provided a copper boom; the fifties were known as the golden decade. The population having exceeded the prescribed limit fixed by the Imperial Act, the first Constitution Bill was passed, and a Parliament, consisting of two Chambers, established. At about the same time railways connecting Adelaide with Port Adelaide, also with Gawler and Kapunda, were begun, and the first telegraph line was erected. The extension of the telegraph went on apace, and within three years from that time wires were stretched between Adelaide and Melbourne. The ten-year period ending with 1859 was an important one in the history of the province, and progress from 1836 to that time, though spasmodic, was considerable, as is shown by the following comparisons:—

Year.	Population.	Land under Cultivation.	Revenue.	Total Trade.	Total Shipping.
		Acres.	£	£	Tons.
1836	546	—	—	—	—
1840	14,600	2,687	30,618	335,436	83,787
1845	21,759	26,218	32,433	333,278	26,558
1850	63,700	64,728	238,983	1,416,389	174,000
1855	96,982	140,000	453,641	2,359,153	228,000
1859	122,735	361,884	511,927	3,163,370	216,000

The sixties provide one of the brightest chapters in the history of South Australia. In opening Parliament in 1864, the then Governor was able to make this official pronouncement—"I believe I am warranted in saying that at no other period of the colony's history have we had greater evidence of substantial prosperity." It was a period of great activity, of splendid achievements on the part of explorers, and glorious triumphs in the work of developing natural resources. Rich copper deposits were again discovered, this time on the northern end of Yorke's Peninsula. These have proved the most valuable copper deposits yet found in Australia. Exploring parties pushed their way north and west. On the third attempt John McDouall Stuart, the famous explorer, crossed the continent from south to north, and returned over his own tracks, thus solving the problem of the interior and providing a base line from which others could operate in laying bare the mysteries of inland Australia. In 1863 the Northern Territory, a tract of semi-tropical country consisting of 340,097,280 acres, was by Royal Letters Patent annexed to South Australia, and active operations were at once begun to settle the newly-acquired possession. Colonists were further excited by a visit from the Duke of Edinburgh, the first member of the Royal Family to cross the seas to Australia. By 1864 exports of staple produce had reached an annual value of £3,000,000, or over £20 per head of the population—a splendid achievement for a handful of people to accomplish within a period of 28 years. Shipments of cereal products amounted in that year to £1,464,000; wool contributed £775,000; metals and minerals, £691,000. In an official report dealing with trade in 1864 it was stated:—"Agricultural, pastoral, and mineral produce formed, as usual, the great bulk of the year's

exports, and wool and copper were shipped in quantities of nearly equal value : but the breadstuffs exported were worth as much as the pastoral and mineral produce put together. This was, however, the result of exceptional circumstances, the value of cereal produce usually averaging from 10 per cent. to 15 per cent. higher than that of the other two staples. In fact, comparing the average yearly exports of each class during the past five years with the averages for the preceding similar period, it will be found that the shipments by agriculturists bore a less percentage to the value of the total exports during 1860-64 than in the years 1855-9. For instance, in the two periods, breadstuffs, &c., have decreased from 39.3 per cent. to 38.8 per cent. of the total exports of produce ; minerals from 27.1 per cent. to 25.7 per cent. ; and, on the other hand, wool has increased from 31.5 per cent. to 31.8 per cent."

The population increased from 124,112 in 1860 to 181,146 by the end of 1869, and the public revenue rose from £438,827 to £777,351 in the same period. In 1865 the national income



A Mammoth Stack of Grain, containing 25,000 bags.

exceeded a million sterling. Agricultural expansion was of steady growth. In 1860 the cultivated area was 428,816 acres, by 1869 the acreage tilled had risen to 850,576 acres. At the end of that year the total trade turnover was valued at £5,747,805. There were 4,436,000 sheep, 119,000 cattle, and 73,000 horses in the colony. Staple produce exported was valued at £2,722,438.

Telegraph and Railway Construction.

This forward movement was well maintained during the next decade. The industrial expansion, though less sensational in the seventies, was substantial, and in other directions some remarkable work was accomplished. In the face of numerous difficulties, and at great expense, the province—then comprising less than 200,000 inhabitants—ran a telegraph wire through the heart of the continent, a distance of 2,000 miles. The cost exceeded half a million. The completion of this undertaking provided the first connecting link between the old world and the new. Australia

has ever since been indebted to South Australia for the enterprise thus exhibited. A few years later a telegraph line connecting Adelaide and Perth was constructed. The route of this second transcontinental service followed the tracks of the dauntless Eyre, and its completion represented a second triumph for an enterprising people who were bridging the continent and increasing the means of communication. Further explorations were conducted, which helped to remove wrong impressions concerning Central Australia. In political circles considerable activity was displayed, and important public works were carried out. During one session a loan of £3,000,000 was authorised, and Bills were passed sanctioning the construction of 380 miles of railway. Agriculturists were pushing their way northward, and, assisted by improved transport facilities, production increased at a rapid rate. In 1875 over 500,000 acres were sold, and two years later 638,000 were alienated—the largest area dealt with in one year, with the exception of 1881, when 640,000 acres were disposed of by auction.

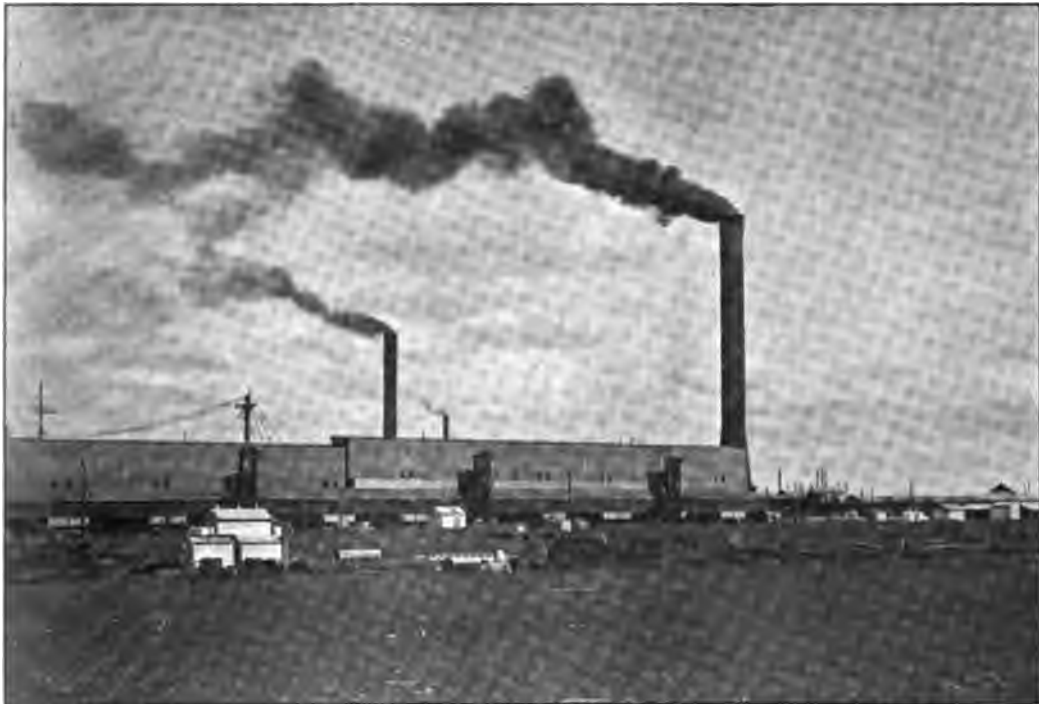


A Harvesting Scene.—Threshing Wheat.

Railway construction was pushed forward rapidly during the next few years, including the important railway connection between Adelaide and Melbourne. Trade steadily improved until combined exports and imports reached an annual value of £17,000,000 in 1870. Staple produce worth £4,670,000 was sent away to overseas customers in 1888. Total acreage under cultivation rose to 2,864,000 acres in 1889, in which year 1,610 miles of railway were open to traffic. In 1887 South Australia celebrated its jubilee by holding an exhibition, and a magnificent demonstration was given of the industrial progress made since the proclamation. The building cost £68,000, and was kept open six months, during which time 790,000 persons attended. The aggregate value of imports had by that time reached a total of £119,644,000, while exports amounted to a total of £102,000,000. Toward this latter sum shipments of wheat and flour contributed £36,000,000; other agricultural produce, £1,300,000; wool, £39,000,000; and copper, £19,000,000. At the end of 50 years of colonising efforts 1,950,000

acres were under wheat; 360,000 utilised for hay, and 610,000 acres were devoted to other crops. The sheep in the province mustered 6,700,000; cattle, 389,000; and horses, 168,000. The population within the city boundary was 45,000, and in the whole of South Australia there were 308,000 inhabitants.

Minerals. The eighties witnessed one of the most important industrial developments in the history of South Australia. Valuable mineral deposits were discovered near the border of the province which led to a remarkable improvement in trade and exercised far-reaching influence. The great Barrier silver and tin fields—including some of the richest silver mines in the world—though in New South Wales, belonged, geographically and commercially, to South Australia. For 15 years they have been exploited by our capitalists—large and small—by merchants and producers, and tapped by the railways of the State. Some idea of the magnitude of the business



Silver-lead Smelting Works, Port Pirie.

[J. Jobson, Photo.]

done can be gathered from the fact that in 1906 produce to the value of £2,200,000 came over the border from New South Wales, while local produce worth £2,705,000 was sent over the border in return. It was South Australian capital that opened up the leading mines, and for many years the largest interests in these great properties were held by our people. South Australian enterprise gave the Barrier silver districts railway communication to the seaboard, and ever since this State has enjoyed an immense carrying trade to and fro. The prosperous mining town of Broken Hill, with a population of nearly 40,000 persons, has provided South Australian producers with an excellent market.

There was a growth in the general trade of South Australia during the period 1881-91, which can only be characterised as "marvellous." Mr. Coghlan draws special attention to the "marked impetus," and says that South Australian trade in 1891 represented a trade of £64 3s. 4d. per inhabitant, "being almost without parallel in any important country." By

1890 the population had grown to 314,195 inhabitants, the public revenue reached £2,557,732; total land under cultivation stood at 2,649,098 acres; total trade amounted to £17,090,051; exports of staple produce had risen to £4,410,062.

The last decade of the century proved disastrous in many directions for the whole of Australia, and South Australia suffered in common with its neighbors. Early in the nineties financial troubles began to appear on the surface, and the year 1893 witnessed the suspension of several banks. The seasons were unfavorable, and the rainfall was below the average. South Australia came through the crisis remarkably well, and, considering the severity of the drought, production was well maintained, while there was no appreciable increase in the list of insolvencies as a result of bank failures and bad times. By the consummation of Federation at the opening of the century the term "State" was substituted for that of "colony" or "province," as South Australians preferred to have their country described, and South Australia became a member of the Commonwealth of Australia by the voluntary act of a substantial majority of electors. The seventh decade in the history of what is now the Central State of United Australia opened full of promise. Confidence was restored in financial and commercial circles, trade moved on the up grade, and the outlook for rural producers was never brighter. There is increased activity in all departments of industry. The public revenue is buoyant—so much so that deficits have given way to surpluses—and in all directions there is a strong demand for land and a growing disposition to develop the natural resources of the country.

Marvellous Progress.

The wonderful record of industrial and commercial growth made during the 70 years of South Australia's history may be gathered by a glance at the following tables. The increase of population has not been rapid, but a steady growth is shown by the following:—

					Total Inhabitants.						Total Inhabitants.
1840	..	..	..	..	14,600	1880	..	..	..	..	267,573
1850	..	..	..	..	63,700	1890	..	..	..	..	314,195
1860	..	..	..	..	124,112	1900	..	..	..	..	357,099
1870	..	..	..	..	183,797	1907	..	..	..	..	392,431

Settlers early devoted attention to the making of roads and building railways and telegraphs. The whole of these belong to and are worked by the State. In the construction of railways alone over £13,000,000 has been expended. The gradual extension of transit facilities is thus disclosed:—

Year.	Main Roads.	Railways.	Telegraphs.	Year.	Main Roads.	Railways.	Telegraphs.
	Miles.	Miles.	Miles.		Miles.	Miles.	Miles.
1840	—	—	—	1880	1,449	667	6,904
1853	33	—	—	1890	4,485	1,610	12,178
1860	175	56	654	1900	4,500	1,736	17,543
1870	597	133	1,718	1906	4,500	1,832	21,179

Production was materially assisted by the improvements made in the means of conveying goods to and from the seaboard. The "area under cultivation" has steadily expanded:—

					Land under Cultivation. Acres.						Land under Cultivation. Acres.
1840	..	..	..	..	2,687	1890	..	..	..	..	2,649,098
1850	..	..	..	..	64,728	1900	..	..	..	..	3,279,406
1860	..	..	..	..	428,816	1902	..	..	..	..	3,122,800
1870	..	..	..	..	959,006	1907	..	..	..	..	3,239,891
1880	..	..	..	..	2,574,489						

Wool and wheat have been the two great staple products from the first. In later years wine has come rapidly to the front. Fluctuation in market prices reduced the monetary returns in recent years, but a diminution in the cost of production has helped to compensate the grower :—

Year.	Wool.	Breadstuffs.	Wine.	Year.	Wool.	Breadstuffs.	Wine.
	£	£	£		£	£	£
1840 ..	8,740	—	—	1890 ..	1,353,762	2,018,719	50,738
1850 ..	131,731	38,312	—	1900 ..	1,003,391	863,463	78,153
1860 ..	573,977	499,102	1,430	1902 ..	1,061,809	1,229,212	124,916
1870 ..	902,696	470,828	12,097	1906 ..	1,561,564	2,676,959	99,247
1880 ..	1,716,171	2,469,720	8,481				

In minerals copper has easily led.

Year.	Copper.	Minerals, Total Value of.	Year	Copper.	Minerals, Total Value of.
	£	£		£	£
1840 ..	—	—	1890 ..	226,992	284,893
1850 ..	353,890	365,464	1900 ..	394,446	448,289
1860 ..	420,905	446,537	1902 ..	430,712	517,825
1870 ..	568,780	574,090	1906 ..	802,260	820,460
1880 ..	346,174	347,246			

Animal life thrives in all parts of South Australia. There is no better climate in the world for the rearing of high-class sheep, cattle, and horses. The mildness and evenness of the temperature makes the housing of live stock unnecessary ; consequently artificial feeding has never been practised. The number of sheep, cattle, and horses in the State at the periods named is shown as under :—

Year.	Sheep.	Cattle.	Horses.	Year.	Sheep.	Cattle.	Horses.
1840 ..	200,160	15,100	1,060	1880 ..	6,463,897	307,177	157,915
1850 ..	984,199	60,034	6,488	1890 ..	7,004,642	359,938	187,688
1860 ..	2,824,811	278,265	49,399	1900 ..	5,235,220	214,761	166,790
1870 ..	4,400,655	136,832	83,744	1907 ..	6,624,941	325,724	206,633

South Australians have always enjoyed a high reputation as traders. The State has been frequently referred to as the "Scotland of Australia," a title which is intended to convey a compliment to the sagacity, honesty, and prudence of her merchants and traders. On a *per capita* basis of comparison there are few countries in the world that have a better trading record than South Australia. At one period—the decade 1881-91—South Australia had an annual

turnover equal to £64 3s. 4d. per head of population—a record certainly without parallel in Australasia, and scarcely exceeded by any country. The following statement is an instructive comparison—one which bears eloquent testimony to the progress and prosperity of the State:—

Year.	VALUE OF IMPORTS.		VALUE OF EXPORTS.	
	Total.	Per Inhabitant.	Total.	Per Inhabitant.
	£	£	£	£
1840	303,357	20 15 6	32,097	2 5 3
1850	845,572	13 5 5	570,817	8 19 2
1860	1,639,591	13 4 2	1,783,716	14 7 7
1870	2,029,793	12 1 8	2,419,488	13 3 3
1880	5,581,497	20 17 2	5,574,505	20 16 8
1890	8,262,873	26 5 11	8,827,378	28 1 0
1900	8,034,552	22 9 11	8,029,157	22 9 8
1906	9,702,284	25 10 7	11,933,171	29 0 7
1907	12,120,052	30 18 4	13,769,399	35 7 6

The expansion of the export trade in articles the produce of the colony is an inspiring record:—

Year.	Staple Exports.	Average per head of Population.	Year.	Staple Exports.	Average per head of Population.
		£ s. d.			£ s. d.
1838 ..	5,040	0 16 10	1870 ..	2,123,297	11 11 0
1839 ..	9,165	0 18 4	1875 ..	4,442,100	21 11 0
1840 ..	15,650	1 1 5	1880 ..	4,829,577	18 0 11
1845 ..	131,800	6 1 2	1885 ..	4,385,599	14 6 5
1850 ..	545,040	8 11 2	1890 ..	4,410,062	14 0 8
1855 ..	686,953	7 1 8	1900 ..	3,610,517	10 2 2
1860 ..	1,576,326	12 18 6	1906 ..	7,439,841	19 11 6
1865 ..	2,574,657	17 11 9	1907 ..	8,338,213	21 5 5

The value of "total trade per head" stood for South Australia at £35 9s. 10d. in 1881; £64 3s. 4d.—the highest for Australasia—in 1891; and £42 19s. 7d. in 1901. On a *per capita* basis of comparison ranks second highest among the States for exports of staple produce and total trading.

The growing trade of the State required the services of a large fleet of ships, and in no direction has there been a more remarkable evolution than in the class of vessels trading to our ports. The number and tonnage of vessels entering and leaving South Australian ports is set out below:—

Year.	Number of Vessels.	Tonnage.	Year.	Number of Vessels.	Tonnage.
1840 ..	425	83,787	1880 ..	2,156	1,200,904
1850 ..	559	174,455	1890 ..	2,122	2,190,442
1860 ..	662	209,036	1900 ..	2,013	3,552,636
1870 ..	916	287,989	1906 ..	2,605	5,564,308

The claim that South Australians as a people are frugal is supported by this record of the Savings Bank :—

Year.	Number of Depositors.	Amount Deposited.	Average Credit per Depositor.	Year.	Number of Depositors.	Amount Deposited.	Average Credit per Depositor.
		£	£ s. d.			£	£ s. d.
1848 ..	214	6,473	24 16 7	1880 ..	34,287	604,637	30 4 10
1850 ..	672	10,255	17 3 5	1890 ..	69,193	1,054,351	27 15 11
1860 ..	2,567	52,293	34 12 6	1900 ..	106,122	1,832,369	32 17 6
1870 ..	12,569	203,620	33 13 8	1907 ..	139,670	2,872,517	37 19 7

South Australia stands highest among the nations of the world with respect to the *per capita* sum to the credit of depositors at savings banks. The reserve fund of the "people's bank" rose from £8 in 1848 to £25,000 in 1870, and £191,707 in 1907. The total funds of the Savings Bank stood at £5,414 in 1848; £448,658 in 1870; £3,631,537 in 1900; and £5,532,524. in 1907.

In 1870 183,797 persons in South Australia had on deposit in various banks—other than the Savings Bank—£1,196,678. This represents £6 10s. 2d. per inhabitant. In the periods named the comparison was as follows :—

Year.	Amount of Deposit in Bank.	Average per Inhabitant.	Year.	Amount of Deposit in Bank.	Average per Inhabitant.
	£	£ s. d.		£	£ s. d.
1880 ..	4,265,274	15 18 9	1900 ..	5,778,325	13 7 9
1890 ..	7,198,636	26 2 6	1906 ..	7,485,246	19 8 7

The public debt of the State now stands at £27,636,468, representing £72 5s. 4d. per inhabitant. It is necessary to bear in mind, however, that the greater portion of this outlay is represented by public works of a reproductive character, such as railways £13,000,000, water-works £4,500,000, telegraphs £1,003,236. Apart from public works earning interest the debt represents a deficiency to be made good by taxation of only £1 9s. 2d. per head of the population—a small amount when compared with the services rendered.

The growth of the State educational system may be gathered from the following multiplication of public schools and the large increase of scholars :—

Year.	State Schools.	Scholars.	Year.	State Schools.	Scholars.
1850 ..	64	1,867	1890 ..	551	44,804
1860 ..	210	9,843	1900 ..	690	62,439
1870 ..	300	15,108	1907 ..	722	60,000
1880 ..	370	36,277			

CHAPTER VI.

SEVENTY YEARS OF PROGRESS.

FEW records of progress are more striking than those that can be put forward to demonstrate the substantial expansion which has taken place in South Australia during the 70 years of its industrial history. The State was founded in 1836, but production did not begin immediately, and 1842 is selected as a convenient statistical starting point. The following figures speak volumes for the enterprise of a people who have had an enormous territory to develop :—

	1842.	1872.	1902.	1907.
Population	16,000	192,223	362,000	392,431
Land in cultivation .. (acres)	18,940	1,164,846	3,137,175	3,239,891
Sheep (number of)	300,000	4,900,687	5,012,216	6,624,941
Cattle (number of)	26,000	151,662	225,256	325,724
Horses (number of)	1,560	82,215	165,803	206,633
Revenue (£)	23,404	697,422	2,428,560	3,195,285
Expenditure (£)	68,434	700,255	2,650,875	2,897,611
Imports (£)	147,349	2,801,571	6,073,782	9,702,264
Exports (£)	75,248	3,738,623	7,698,514	11,933,171
Staple produce exported .. (£)	29,070	3,542,087	4,768,947	7,439,841
Mineral production .. (£)	186	806,000	518,000	821,000
Savings Bank deposits .. (£)	—	578,517	3,974,709	5,304,704
Railways open (miles)	—	133	1,736½	1,832
Telegraphs and telephones .. (miles)	—	3,731	20,000	21,172
Shipping (tonnage)	25,354	347,360	3,959,352	5,564,308
Public schools (number of)	—	307	716	708

The following statement of the number of persons engaged in agricultural, pastoral, and other productive pursuits in South Australia is taken from the last census—1901. The same details and comparisons will not be available until the next census is taken in 1911. It is certain, however, that during the past six years there has been an all round increase in the following totals :—
Total population (1901), 362,604 ; total breadwinners, 153,296 :

Classification of Occupation.	Persons.	Percentage of Population.	Percentage of Breadwinners.
Primary producers—			
Agricultural pursuits	34,186	9.43	22.30
Pastoral pursuits	7,061	1.96	4.61
Mining	6,301	1.74	4.11
Other primary producers	1,613	.44	1.05
Total	49,161	13.57	32.07
Industrial—			
Manufacturing	24,924	6.87	16.26
Building and construction	8,836	2.44	5.76
Indefinite	7,473	2.06	4.88
Total	41,233	11.37	26.90



(CH VI.)

THE CITY OF ADELAIDE LOOKING SOUTH-EAST FROM NORTH ADELAIDE.

[McGinn, Photo.]

The Primary Producer's Record.

South Australia is a country where the primary producer is King. His sovereignty is undisputed, his reign continuous. Upon the products of the soil depends the prosperity of the people. The flockmaster with his sheep, the herdsman with his cattle, the tiller of the soil with his cereals and fruits, have made South Australia what it is to-day, one of the most self-contained and prosperous States in the Commonwealth of Australia. From the earliest days of the State's history primary products have been the dominating factor of national progress. Were seasons favorable and harvests bountiful then the merchant, the trader, the professional man, and the laborer, down through all departments of industry, participated. Did the droughts come and blight the cereal crops, and cause mortality among the flocks and herds, the evil influence was felt by all. Notwithstanding the initial handicap of a handful of people having to control and develop so vast a territory; in spite, too, of periods of falling markets—the primary producer has a splendid record to his credit.

The following is a statement of the declared value of the staple exports of the State during 1896, 1901, and 1906, with the aggregate value of each class from the first exportation of the several products and manufactures of the State to 1906, inclusive (arranged under 28 heads):—

Articles.	1896.	1901.	1906.	Aggregate.
	£	£	£	£
Wool	1,228,991	1,029,063	1,561,564	65,687,370
Flour	523,541	440,226	559,555	29,849,787
Wheat	89,515	839,731	2,012,915	30,869,741
Copper ore and metal	222,202	491,617	802,260	25,703,028
Hides and skins	180,657	233,162	411,830	5,559,905
Live stock	132,778	130,230	317,685	3,182,516
Hay and chaff	124,288	75,798	165,420	2,211,594
Bark	51,682	67,601	59,996	1,792,237
Wine	73,316	92,418	99,247	1,744,012
Bran and pollard	28,549	43,872	52,716	1,354,448
Tallow	20,391	4,826	27,065	1,112,142
Eggs	40,353	73,520	106,873	1,460,901
Butter	26,194	17,620	103,171	898,255
Fresh fruit	19,587	62,662	48,196	784,698
Gold	14,350	16,613	52,384	783,251
Preserved meat	21,130	28,181	29,026	620,413
Other minerals	1,562	722	8,000	482,849
Frozen meat	5,664	58,477	133,805	759,047
Manure	136	3,000	8,325	227,870
Barley and oats	1,589	5,223	42,856	320,764
Honey and beeswax	2,805	2,522	6,460	155,123
Vegetables	1,646	8,063	23,405	201,094
Bacon and hams	5,051	9,329	13,550	185,944
Preserved fruit	3,109	2,628	28,967	154,224
Cheese	739	1,258	3,721	28,413
Frozen poultry, game, &c.	132	1,144	195	10,697
Salt	25,050	53,286	76,248	654,613
Unenumerated	449,677	477,095	760,554	9,548,470
Total values	3,269,612	4,216,601	7,439,841	185,343,350
Imports re-exported	4,324,442	3,799,288	4,493,330	99,051,025
Total exports	7,594,054	8,015,889	11,933,171	284,394,375
Total imports	7,160,770	7,371,587	9,702,264	263,368,004
Imports retained	2,836,328	3,572,299	5,208,934	164,316,981
Combined imports and exports	£14,754,824	£15,387,476	£21,635,435	£547,762,379

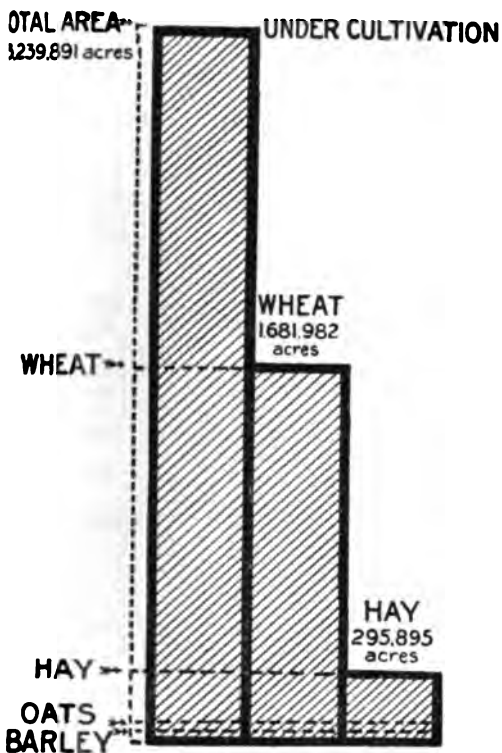


Apple-packing, Angaston.—Large Quantities of Apples are Shipped to England.

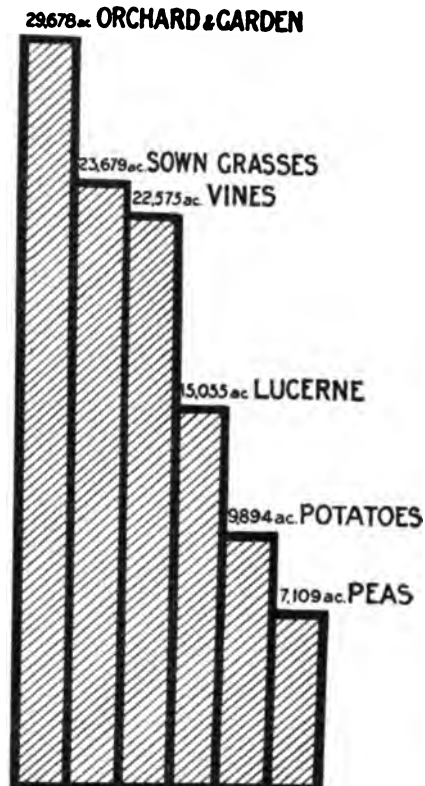
Wealth from the Land.

The following diagrams, prepared by Mr. W. L. Summers, Secretary for Agriculture, demonstrate in a striking way the wealth obtained from the land. The first two drawings show the area under cultivation for various crops. South Australia is essentially an agricultural State, and the production of cereals is an important branch of the great rural industries of the country. The second diagram illustrates the land devoted to other crops than cereal. These columns have no comparative relation to the preceding diagram, but are drawn to scale, with the area under "orchard and garden" as a basis. Considerable attention is being devoted to fodder crops by flockmasters and farmers, and sown grasses, lucerne, and such favored crops as rape and kale are sure to occupy a largely increased area in the near future. By the growing of summer fodder crops the carrying capacity of the country will be appreciably increased during the next few years.

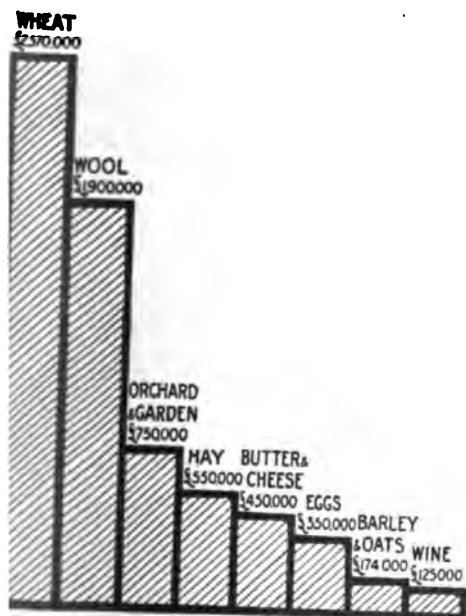
Another diagram shows the approximate values of the principal agricultural productions of the State on the basis of the season 1906-7. Wheat, it will be observed, comes first, with £2,570,000 to its credit, and wool is next with £1,900,000. Exports of produce from orchards and gardens are increasing each year, and it will not be long before this column, as well as those representing butter and cheese, eggs, and wine, will have to be extended. The last statistical comparison is interesting as showing the relative values of products exported to all countries in a given year. During recent years there has been a marked increase in the shipments of staple produce, as may be gathered from the fact that whereas in 1898 exports were worth £2,487,000, staple products sent away in 1907 were valued at £8,338,213. The diagrams give ample evidence of South Australia's prosperity. If the returns of primary production are studied it will be seen that the State has been passing through wonderfully favorable seasons. The man on the land is, after all, at the base of prosperity. The population figures were never before so full of hope, and among other things this has meant a larger home market for the commodities which producers and manufacturers have had to sell. Land is in strong demand; employment is good; savings are accumulating; and there is an air of contentment about the "man in the street" that is convincing.



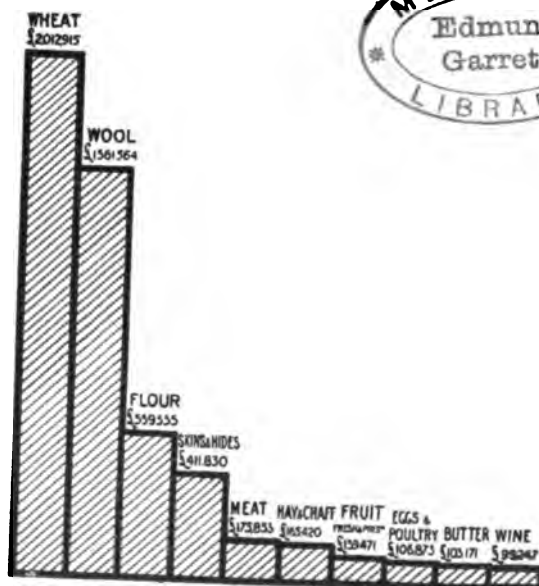
1.—Diagram showing Areas under Cultivation of Cereal Crops in South Australia, Season 1906-7, and Proportion of each to Total Area Cultivated.



2.—Diagram showing Acreage of "General" Crops (all other than Cereals) in South Australia, Season 1906-7.



3.—Comparative Value of Principal Agricultural Productions of South Australia, Season 1906-7.

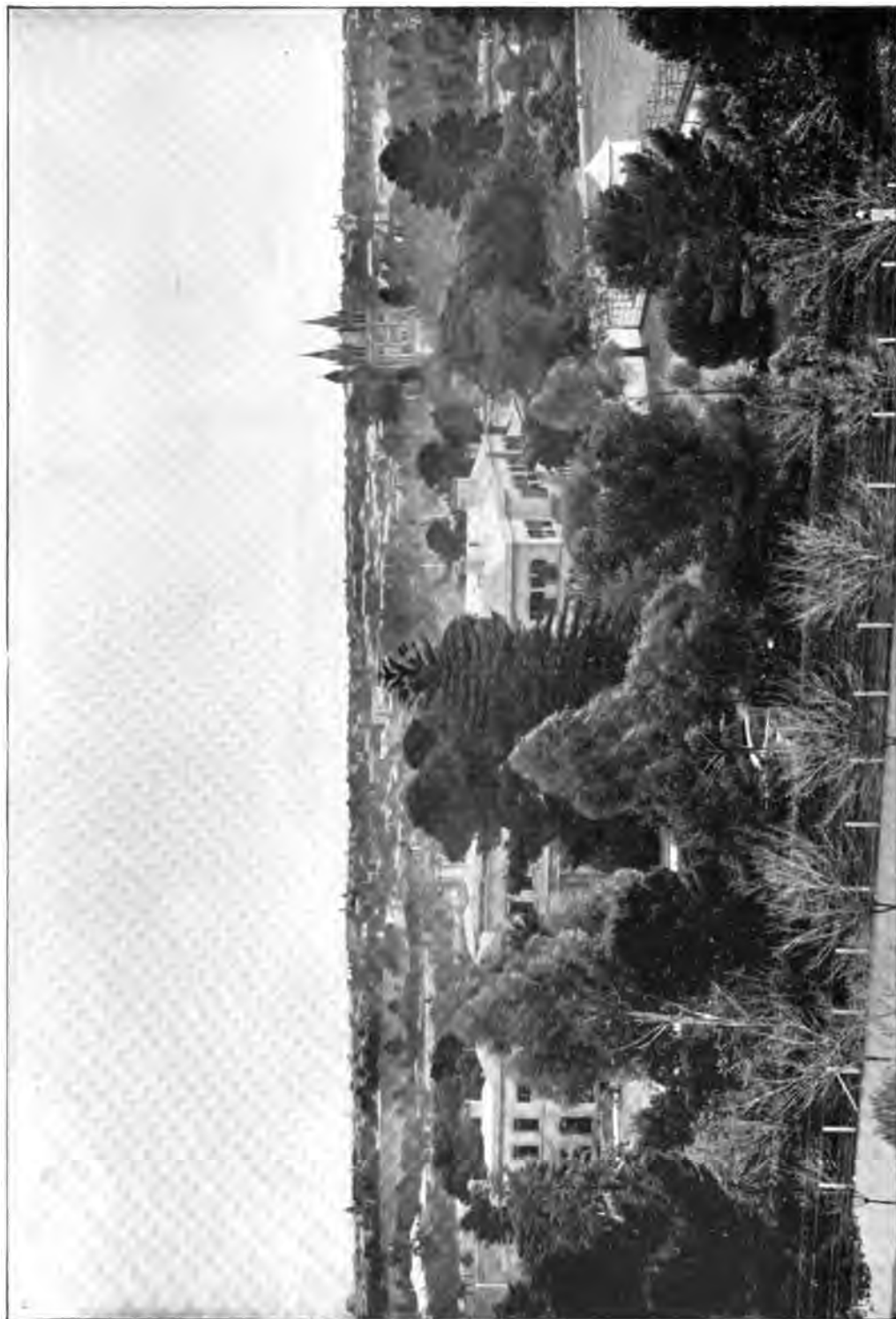


4.—Comparative Values of Exports of South Australian Produce to all Countries in 1906.



The countries with which South Australia has done business with staple produce during the last three years is shown in the following official figures :—

To.	1904.	1905.	1906.
	£	£	£
Commonwealth	2,322,695	2,383,260	2,401,067
New Zealand	10,705	12,372	18,042
United Kingdom	2,409,758	2,335,377	3,064,812
Other British possessions—			
Burmah	—	99	82
Cape Colony	204,268	311,902	358,584
Ceylon	6,188	14,338	12,081
Fiji	370	—	—
Hong Kong	8,293	6,633	12,298
India	50,725	10,200	19,488
Mauritius	39	2,526	21,519
Natal	149,692	93,366	89,183
St. Helena	—	801	362
Straits Settlements	5,706	45,989	95,044
Total British countries	5,168,439	5,216,863	6,092,562
Foreign countries—			
Arabia	10	—	—
Argentina	—	—	2
Austria	—	50	216
Belgium	49,651	100,030	191,295
Bourbon	3,768	—	—
Celebes Islands	—	2,690	5,518
Chili	—	—	148,063
China	9,428	—	5,720
Delagoa Bay	93	112	—
Egypt	2,825	61	25,837
France	62,927	356,155	396,465
Germany	46,994	136,558	273,661
Greece	11	—	—
Italy	5,469	538	31,420
Japan	229	1	82
Java	67,074	88,995	99,641
Moluccas	—	37	457
Netherlands	2,288	1,616	174
New Caledonia	260	138	109
Peru	—	80,642	84,437
Philippines	2,911	56	31
Portuguese East Africa	—	—	20,172
Reunion	—	4,484	4,900
Spain	—	27,564	26,705
Sumatra	307	1,768	2,737
Sweden	—	—	13,240
Switzerland	—	—	82
Turkey	—	—	225
United States	7,421	13,261	16,090
Total foreign countries	561,666	814,756	1,347,279
Grand total	£5,730,105	£6,031,619	£7,439,841



(McGann. Photo.)

VIEW OF THE CITY OF ADELAIDE, LOOKING NORTH.
Showing Government House in Foreground and Anglican Cathedral in the Distance.

CHAPTER VII.

THE CLIMATE.



HERE is no better climate in the world than that which prevails in South Australia. The settler is not troubled by extremes of weather. The newcomer is charmed with the ideal conditions experienced during the winter months, and though at first the heat of a few summer days may be trying to a person fresh from colder regions, it is soon recognised that the weather is not nearly so enervating, though the thermometers show high readings, as in a climate where humid conditions prevail. The humidity of the climate is exceptionally low—lower, and therefore dryer and more bearable, than in some other parts of the continent. Never does the sun smite so fierce as to prevent the farmer from harvesting his grain in healthy dry heat; and never, of



A Land of the Vine.—South Australia Produces the Finest Grapes in the Commonwealth.

[McGinn, Photo.]

course, has a cricket match been postponed merely because the thermometer has set the example of scoring a century! The in-between seasons—really there is no strictly defined or long-lived autumn or spring—are a gradual bracing from summer to winter. No serious epidemic has ever visited this State, which shares with the island State of Tasmania the lowest death-rate in the Commonwealth. The territory of the State extends south to north from the temperate Southern Sea to the torrid Indian Ocean. It covers over 26 degrees of latitude, and fairly slices Australia's huge continent down the centre. On the western side lies the big neighbor of Western Australia; along the east first runs the Victorian border, then New South Wales, and finally Queensland keeps in touch with the Northern Territory. The temperate zone of the southern

portion of the State corresponds closely to the beautifully equable climate of Italy. In the northern parts tropical conditions are met with. The mean rainfall over the agricultural area of South Australia is over 21in., and for Adelaide 20·326. The mean yearly temperature at Adelaide is 63·0, and the mean humidity 58 per cent.

Generous Tributes. A visitor to South Australia declared in the public press—
 “Why, you have an embryo America here. Your resources are illimitable. A glorious climate, and a white, clean-bred, sturdy race of English-speaking people, with vast and resourceful territory, and the markets of the world clamoring for your products. Your rainfall is plenteous; your catchment areas are vast. Go in more for dry farming and irrigation and—continue to prosper. I’m coming



In an Orange Grove in the Valley of the Torrens.

back here some day. I want a rest I want those glorious vistas of prosperous homes, those beautiful hills and valleys. I want the ozone down at your seaside towns. I want the heather and vineyards; more of those heavenly highways that you call roads; and, above all, I want some more of the warmth and welcome that have been extended to me—a stranger in what he would be proud to call his own land.”

The “Guide to Australasia,” published by the Nord-deutscher Lloyd Steamship Company, of Bremen, states that Adelaide “may be considered as one of the model cities of the Commonwealth.” Of the climate of South Australia the editor says—“For the greater part of the year the weather conditions are really delightful, approximating to the most agreeable spots on the shores of the Mediterranean. The climate has the reputation of being very salubrious, and even the summer heat, being dry, has less of the unpleasantness which characterises the humidity of Melbourne and Sydney. The winter months are especially bracing.”

Blue Skies and Genial Sunshine.

Although there are periods in midsummer when extremes of heat are experienced, the "heat waves," as they are termed, do not last long, and are followed by delightfully refreshing southerly breezes. Dwellers in the city and its suburbs can at all times, by a frequent train service and in a comparatively few minutes, reach hillside and seaside localities where the temperatures rule lower. "South Australia's summer," remarks Sir Charles Todd, who was for years the Government Astronomer, "may be regarded as extending from October to March. After that month the temperature falls rapidly. The weather during April and May is simply perfection, and the same applies to most of the winter and until the end of October." The coldest months are June, July, and August; but so equable is the climate that it is never necessary to house and artificially feed sheep, cattle, or horses. The most valuable stud Merino sheep are grazed in open paddocks on natural grasses all the year round. The mean temperature during June, July, and August, over a period of about 45 years, has been 53.5, 51.5, and 54.0 respectively. Sir Charles Todd continues—"During these months, and occasionally even



"A Land of Blue Skies and Sunshine, where Fruit Grows in Abundance."

[J. C. Reiner, Photo.]

in September, there are frosts, especially on the high-lying plains to the north." The mean temperature for the summer months—December, January, and February—is 71.3, 74.2, and 74.0. The thermometer exceeds 90.0 on the average in eleven days during December, ten days in January, and nine days during February. "The extreme dryness of the air," says the Government Astronomer, "renders the heat very bearable and healthy." Fruits and cereals of every kind grow luxuriantly. South Australia possesses the finest and largest vineyards in Australia. Live stock are free from disease, and if the active staff of stock inspectors can prevent it, there never shall come to South Australia a stock-destroying microbe.

A "Really Beautiful" Climate.

Sir Charles Todd has further observed—"The climate of South Australia is 'really beautiful,' and affords a great number of pleasant days on which outdoor pursuits can be carried on with buoyancy of spirits. The clearness or transparency of the atmosphere is something wonderful, and, owing to its dryness, except on hot-wind days, is seldom oppressive. Cricket matches are played with the usual enthusiasm

before crowds of spectators with the thermometer ranging between 90° and 100° in the shade, and I have ridden 50 miles on a day with the temperature as high as 110° without much inconvenience. The explanation is that these high temperatures are always accompanied by such an extreme dryness of the air that perspiration affords instantaneous relief."

In the interior, where the heat during the day is greatest, the nights are delicious, and fully compensate for the vigor of the sun. Explorers and travellers have experienced no difficulty in penetrating into the heart of Australia, and station hands and drovers living in the country for years at a time seldom know what an illness is. It is recorded of one exploring expedition that no occasion arose to open the medicine chest, with which the party had been supplied. The explorers spent many months in travelling about Central Australia, and although enduring the usual hardships, the general health of all the party was perfect.

In the hills, which form so beautiful a background to the City
In the High Lands. of Adelaide, the weather is delightful in the summer. These districts are connected with the metropolis by railway and excellent roads. The handsome residences of wealthy colonists and the well-kept orchards add to the great natural beauties of the mountains, which are largely resorted to by citizens at week-ends and holidays. One of the prettiest sights is the chess-board patterns on the hillsides. Here is a square of vivid green: it is a vineyard. There a patch of a darker green: lucerne. Side by side is the rich chocolate of the natural soil fallow land awaiting the time of seeding. Scattered near and far are strips and swathes of vari-cultured vegetables foliage and flowers, natural and imported shrubs and trees. As the overland express train sweeps through the Mount Lofty Ranges gaudy splashes of coloring denote the heather and other flowering bushes and wild plants. The predominating shade of South Australia's wild blossoms is yellow—yellow like the sun in the deep, blue sky. Queen of the yellow blossoms is Australia's golden wattle. Whole groves splash their brightness on every side of the express train. In parts the eye is dazzled by the reflection—lorious sun-spot of a wattle grove. Beautiful trees run riot and free all over the landscape not a mile from the hilly outskirts of the metropolitan area. The National Park, comprising 2,000 acres of beautiful fern glens and wooded hills, is situated in these high lands: a half-hour's tortuous winding through tunnels, but a mere seven miles from the heart of the capital city. Throughout the whole year it constitutes a huge playground for the people. New and old forms of green things abound and are always being freshly planted. Winding traffic and footways skirt the wild-rose-grown streamlets; cleared spaces and scores of tennis courts give scope for athletic amusements. The Park is a favorite spot for South Australia's hundreds of motorists.

There cannot be anything wrong with the climate of a country
A Low Death Rate. which has such low death rates as those recorded in the metropolitan area and for the whole State. The death rate per 1,000 of mean population of Adelaide and South Australia is as follows, over a series of years:—

Year.	Adelaide Municipality.	Adelaide and Suburbs.	South Australia Proper.	Year.	Adelaide Municipality.	Adelaide and Suburbs.	South Australia Proper.
1896	22.81	14.20	11.71	1902	23.82	13.82	11.77
1897	22.29	14.23	11.54	1903	21.36	12.67	10.71
1898	26.77	16.44	13.48	1904	20.38	11.94	10.17
1899	24.21	14.40	12.53	1905	21.14	11.70	10.14
1900	20.31	12.74	10.65	1906	21.79	11.91	10.29
1901	22.43	13.13	11.11	1907	21.91	11.61	9.92



THE "GOLDEN FLEECE" ON VIEW IN ELDER SMITH & CO.'S MAMMOTH WOOL STORE PORT ADELAIDE.

(en. viii.)

CHAPTER VIII.

THE PASTORAL INDUSTRY.

THE rise and progress of the pastoral industry in Australia constitute one of the finest records of expansion to be found in the history of any country. In less than a century from the introduction of the first sheep and cattle into New South Wales, the flocks of Australia numbered 124,000,000 sheep, the herds aggregated 12,000,000 cattle, and there were 1,700,000 horses. Exports of wool have represented an annual value of over £25,000,000, and the total value of pastoral property in seven colonies was estimated a few years ago at £300,000,000. On December 31st, 1906, there were in the Commonwealth 1,765,186 horses, 9,349,409 cattle, 83,687,655 sheep, and 813,569 pigs. The number of horses, cattle, and sheep were greater than for any other year since Federation. In every way 1906 was a greater year pastorally than any other in the history of the Commonwealth. There were exported 415,353,590lbs. of greasy wool and 64,889,295lbs. of



Flock of Sheep Camping for the Night.

scoured. These were valued at £17,547,037 and £5,098,732 respectively. In addition, there were tallow, 684,779cwts.; sheepskins, 7,947,021; frozen mutton and lamb, 90,692,395lbs.; and 17,979 live sheep. These were valued—the tallow at £878,699, the sheepskins at £1,614,463, and the frozen meat at £1,095,120, and the live animals at £48,699. Thus the total value of exports produced from the sheep was, in 1906, £26,282,750. From the cattle the total produce was much smaller. Frozen beef accounted for £434,455 (about a third of the value of the exports in 1901). Hides worth £168,497 were exported, hoofs and horns worth £26,845, and living cattle worth £5,373. The total value of the exports produced from cattle was therefore £635,170, while the total value of pastoral products exported was £27,431,454. This is about £8,000,000 more than in 1901, £11,000,000 more than in 1902, £10,000,000 more than in 1903, £7,000,000 more than in 1904, and £3,000,000 more than in 1905—a steady improvement. Towards these colossal totals South Australia has contributed for 70 years. The annual return from pastoral

pursuits in South Australia is approximately £2,500,000. During 70 years of chequered history, yet steady expansion, the wool industry has contributed no less an amount than £65,788,101 to the staple exports of South Australia.

**Pastoralists as
"Pathfinders."** The history of pastoral growth in these lands is the political, commercial, and social record of our island continent. They are so closely interwoven that it is difficult to distinguish their respective influences on one another. Australia owes more than it is

possible to estimate to her shepherd kings, who were the pioneers of pioneers—the first to turn their backs on the coastline and face the unknown. Theirs was a strenuous life from the first. They went out into the wilderness and did their own exploring work, occupied and proved the country, then moved on to make room for the farmer and other rural producers. But for the flockmasters, the occupation of some portions of South Australia would have been greatly delayed. They carried their lives in their hands, lived hard and worked laboriously. Who shall calculate the influence of their courage and sturdy independence, their patience in the face of difficulties, their self-reliance and hopefulness, or attempt to measure the results which have directly sprung from their victories over the natural conditions of an unmapped country? The pastoralist was called upon to solve geographical mysteries, to deal with treacherous natives; and the great warrior who burned his boats was not more determined than were the pioneer



Head Station on Cattle Run, Central Australia.

woolgrowers and herdsmen who cut themselves adrift from civilisation as they pushed their way into the heart of the continent. The blacks were troublesome in the early days, and flocks had to be carefully shepherded during the daytime and yarded at night. One early squatter was so disheartened at the depredations of the aborigines and his inability to stop them, that he sold property for £300 which subsequently was leased for 30 years at an annual rent of £10,000! The natives soon learn to appreciate the distinction between *meum et tuum*, and become very serviceable on outlying stations. To appreciate the significance of the pioneer work done by the builders of this important industry is to comprehend at one glance the whole romance of colonisation, as regards the development, not only of South Australia, but Australia as a whole. Ever in the van, the pastoralists have been the pathfinders who bridged the ford and cleared the road, and made the country safe and pleasant for exploitation by merchant and mechanic and all that army of workers whose daily prosperity may be measured by the fluctuating prosperity of rural producers.

**The "Inside"
and "Outside"
Squatter.** Fortune smiled from the first on those who were early in the field, and who, by exchanging cash for lands within easy distance of the seaboard, helped the infant province out of pressing financial difficulties and laid the foundations of their own fortunes. Sheep-farming within what is termed the "rainfall line" was a profitable business from the outset, and, although these producers have at times suffered from low prices and bad seasons, their lot has been cast in pleasant places compared with that of Crown tenants in remote localities. While the inside

man has enjoyed almost uninterrupted prosperity, the "out-back" pioneers have had many ups and downs. Although practically "monarchs" of all they surveyed, living a life of great freedom in one of the healthiest climates in the world, their surroundings at the outset were comfortless and uninviting. They were not a feather-bed race, and attached little or no value



View on Outback Cattle Station, Central Australia.

to the luxuries of cities. They lived a nomadic life, pitching their tents at sunset, and by sunrise were extending the circle of colonisation. The outermost station was always the starting point or the city of refuge for the daring explorer. Neither "baronial" nor any other castles were seen on the great sheep and cattle stations in the early days. Two rooms of slab and mud, roofed with broom or ti-tree. An old case for a table, smaller ones in place



A Pastoral Scene, Macdonnell Ranges, Central Australia.

[F. J. Gillen, Photo.]

of chairs. For beds, the floor, with a saddle as a pillow, a rug or blue blanket for covering. Menu for breakfast: mutton and damper. Ditto for dinner and tea, with a few Johnny cakes as a rare luxury. Tea was the standing beverage—newly-made billy-tea—a most refreshing stimulant. A rifle or two and some old-fashioned guns hung on the walls, which were well plastered with cartoons from the comic press, colored pictures from Christmas numbers of the weekly

papers, and representations of racehorses. A few fly-speckled, broken-edged photographs disputed the ownership of the only mantelpiece with short-stemmed clay pipes and jars containing tobacco. There would be a blackfellows' camp a few hundred yards down the hill from "Government House" (as the head-station hut is called), and close up were the drafting yards. It was from some such centre as this—typical of the out-back station-manager's residence—that runs carrying vast flocks or herds, as the case may be, were controlled. Dwelling-places have undergone more or less changes with time and improved conditions. Very often the owner or the manager and his men are absent from the head station for weeks at a time. Then they live in the open: the earth for a mattress, the blue sky for a roof. This description applies to life out-back—a life that is free and healthy and has great advantages. In the more settled parts of the State there are many handsome houses and fine estates, and station life as there represented has numerous attractions. So mild and healthy is the climate of South Australia that man and beast require practically no protection against the weather. This is a most important point for would-be settlers to remember in weighing the advantages of Australia against other



Camel Teams Carting Wool from Outback Sheep Station.

countries as a field for their enterprise. The fact that neither sheep nor cattle are ever housed, and no artificial feeding of stock is required, enables a great saving to be made in the cost of production, and partly explains the rapid expansion of the pastoral industry.

Natural Enemies.

In the early days the pastoralist paved the way. He did more. He tested the country in a variety of ways, sometimes perishing in his attempt to occupy territory which even his pertinacity could not subdue. It was the pioneer stockman who first proved that the climate and soil were admirably adapted for the raising of live stock, and that certain localities were favorable for growing cereals; while several of our most valuable mineral deposits were discovered by shepherds and boundary riders. He did all this in face of many dangers and difficulties. While the white settlers at times dealt out justice in a rough and ready manner, the blacks often took vengeance by murdering shepherds and putting firesticks to grass or huts. The greatest sources of anxiety and expense against which the grower of the "golden fleece" has had to contend—excepting, of course, the rainless seasons—have been wild dogs and rabbits. Vermin have proved a never-ending worry, hundred of thousands of pounds having been spent in carrying

on a relentless warfare against the dingo and the rodent. From the shepherding in the early days—when the flock was guarded by day and yarded at sundown—the evolution has been sheep-proof fences of five or six wires, to wire-netting barriers of various types, topped with barbed wire, in order to check the movements of both stock and vermin. Main lines of vermin-proof fences are now erected at the expense of the lessee, assisted by the Government, in various parts of the State. This tract of country is then divided and subdivided until each lessee is able to cope with his natural enemies within his own boundaries. It was a long time before fencing was substituted for shepherding. The old squatter was prejudiced against posts and wires, but their advantages eventually appealed to him. The modern tendency is toward reducing the size of the paddocks, which saves sheep the necessity of travelling long distances for water and facilitates the preservation of the grass and bushes.



Shearing Sheep by Machinery.

[A. Faughan, Photo.]

Wool-classing. Before a man can be regarded as competent to do classing he must have a thorough knowledge of every portion of a fleece and its relative value as compared with every other part. Every fleece is dissimilar from every other in quality and condition, according to the circumstances under which it is grown. At a glance trained men can appreciate variations of quality where a layman would see no difference. The grades are exceptionally fine in a large clip, as classing is almost an exact science. At one time there was much opposition to the work at the shearing sheds, but the prejudice has been rooted out by the demonstration of the fact that classification yields higher rates to the producer, so that now there is a demand for the students in excess of the supply. The standard of the Adelaide School of Mines is very high, and the wool expert is determined that it shall be maintained, and if possible raised even higher. Already he has done

excellent work on the stations, and wherever he goes he receives a cordial welcome, as it is recognised that his presence and the work of his students is a real asset. It takes four or five years for a student to get a diploma, and during that period he will have classed considerably over 100,000 sheep. Then he has to pass a board of examiners and possess satisfactory recommendations from station managers as to character and ability to manage men. The School of Mines is sending teams to a number of stations. Mr. Mathews constantly lauds the magnificent pioneering work of Mr. George Jeffery, who was the first to fight the prejudice against classing, and really blazed the path through the forest of difficulty for his successor. The first School of Mines teams are sent out at the end of July, and others are going from one station to another till December. It requires care and energy to superintend these students, and so arrange their work that no



Wool-classing by School of Mines Students.

[A. Vaughan, Photo.]

station shall be kept waiting. The North-Eastern sheds start their shearing about the end of July; in the Far North, early in August; in the majority of stations in the North-East, in the first or second week in August; and in the South-East, about the middle of October or beginning of November. Stations are always in charge of a qualified student, who does the actual classing, and the other members of the team carry out the detail work of skirting. The classing is done on sound commercial lines, and fleeces are graded according to quality and condition. South Australia, more than any other State, has a big robust type of sheep, which has been found very stable under the conditions which exist. The character of the wool is largely governed by the condition of the country, and so the classification adopted in one station would not necessarily do for another. Many stations have so improved their flocks that, though they now carry fewer sheep than formerly, they get more wool in the bales.

Flocks and Fleeces.

The foundation of sheep-breeding and wool-growing in this State was laid by the South Australian Company importing Merinos from Tasmania and New South Wales; also rams from Mecklenberg. The first fleet which sailed for South Australia had on board some Leicester and Southdown sheep, and purchases were also made at the Cape of Good Hope, where sheep were then selling at 5s. each. From the very beginning of settlement in this State the value of the squatting industry has been recognised, and South Australians have every reason to be proud of the success achieved in the various enterprises for the rearing of sheep and the production of wool. "The South Australian Company had purchased," says *The Register*, in its first number published in June, 1836, "a very fine lot of rams and ewes of the finest and purest breed of Merinos, which were selected with great care and at much expense in Saxony, by the son of a great sheepholder of Van Diemen's Land for his own stock. They also sent out in their different vessels a supply of pure Leicesters and Southdowns, and ordered the ship *Emma* to call at Capetown and procure other sheep for mutton and for crossing purposes." The policy pursued



A Mob of Ewes from a North-Eastern Station.—After rearing 88 per cent. of Lambs, the Ewes Cut an Average of 11lbs. 7ozs. of High-quality Wool.

by the company had the vigorous support of Colonel Torrens, Chairman of the Board of Commissioners, who, in speaking of the wool staple of Australia, said that "as the population sweeps over the vast regions of America from the Atlantic to the Pacific, and as the free trade in China opens to British enterprise hundreds of millions of additional consumers, the natural, the necessary conclusion seems to be that for generations to come the still increasing demand for Australian wool will be in advance of the constantly augmenting supply; and that the value of this important staple will maintain an elevation sufficient to secure to the British nations growing up in New Holland a degree of prosperity hitherto unexampled in newly settled countries." Heavy losses occurred on the voyage from Tasmania, and the overland journeys from Sydney proved expensive and dangerous. Notwithstanding such drawbacks, however, the South Australian Company and private individuals continued to make importations, so that within two years of the proclamation of the colony the flocks numbered 28,000. By the end of 1841 the company owned 20,000 sheep, and Messrs. Dutton and Bagot, Mr. Duncan MacFarlane, and Mr. G. A. Anstey about 10,000 each. In December, 1837, Messrs. Hallett and Duff shipped four bales

of wool at Port Adelaide for London by the *Orator*. This was the first clip from a South Australian flock. A month later a joint stock sheep company was formed in the colony with a capital of £20,000, and in a very short time the shares were all taken up and the company was in possession of a flock of 600 maiden ewes and 300 wethers. From this time onward there was a rapid increase, so that by 1851 there were over 1,000,000 sheep, early in the sixties over 3,000,000, in the seventies over 6,000,000, the eighties 7,000,000, while in 1891 the high-water mark was reached, when the flocks aggregated 7,745,541. The decline which has since taken place is due to a variety of causes, but the flocks of the States are yearly increasing and wool-production has become a more important industry than at any other period in the history of the State. The following shows the increase of the flocks since 1840 :—

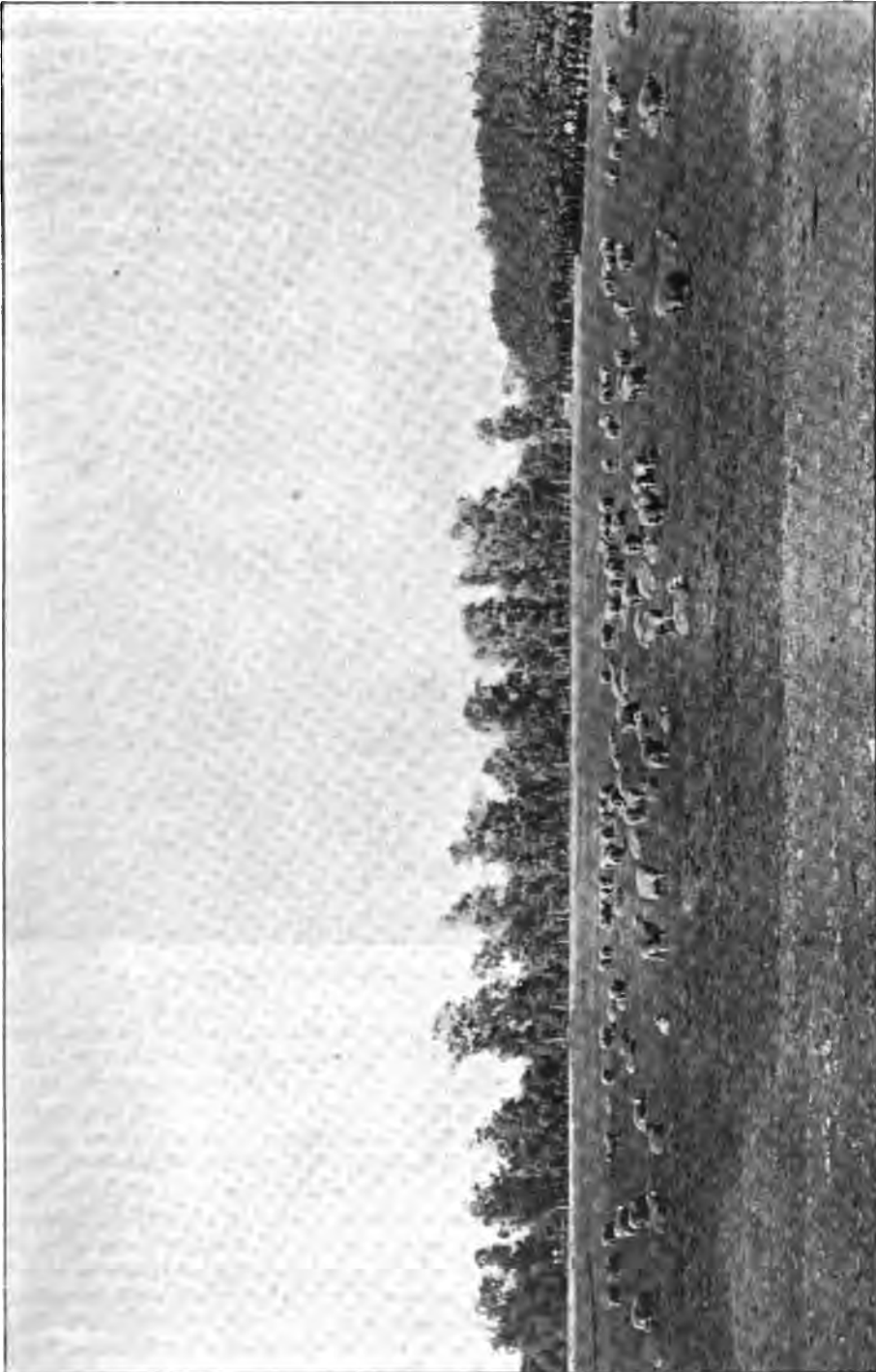
Years.	Number of Sheep.	Value of Wool Exported.	Years.	Number of Sheep.	Value of Wool Exported.
		£			£
1840	200,160	8,740	1880	6,453,222	1,716,171
1845	480,699	72,235	1885	6,696,406	1,417,245
1850	984,199	131,731	1890	7,004,642	1,353,762
1855	1,768,724	283,419	1896	6,233,993	1,228,991
1860	2,824,811	573,977	1900	5,667,283	1,003,391
1865	3,779,307	821,656	1905	5,820,301	1,491,943
1870	4,400,655	902,696	1907	6,624,941	1,561,564
1875	6,179,395	1,833,519			

According to Coghlan ("The Seven Colonies of Australasia"), the weight of wool per sheep has been increasing regularly in each of the States, and that authority says :—"In South Australia the weight of wool per sheep has been consistently higher than in the other States," and the following table supports that view :—

State.	1861.	1871.	1881.	1891.	1901.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
South Australia	4.69	6.41	6.93	6.85	7.9
New South Wales	3.28	4.57	4.47	5.74	7.2
Victoria	4.52	6.17	6.87	5.68	6.9
Queensland	3.40	4.73	4.50	4.73	7.1
New Zealand	3.48	4.76	5.32	6.42	8.1

The comparisons for recent years will not be available until the next census is taken, but it is well known that the weight of wool per sheep has been increased since 1901. A few years ago, when 120,000,000 sheep were shorn, the yield was 1,959,000 bales, while in 1906 103,000,000 sheep produced 2,130,000 bales, showing that 12 and 13 years ago it took the fleeces and skirtings from, say, 61 sheep to fill a bale, whereas last year the wool (fleeces, skirtings, &c.) from 49½ sheep did so. Within the last 12 months Australasia has been paid £30,240,000 cash for wool, or £4,410,000 more than in 1905-6; £10,000,000 more than in 1904-5, and no less than £16,300,000 more than in 1903-4. South Australian woolgrowers have shared in this wonderful increase in the yearly value of the wool clip. The following comparative statement over a period of years shows the number of sheep per bale and number of bales per 1,000 sheep produced in Australasia :—

Year.	Number of Sheep Shorn per Bale	Number of Bales per 1,000 Sheep.	Year.	Number of Sheep Shorn per Bale.	Number of Bales per 1,000 Sheep.
1896-7	59.65	16.75	1902-3	51.20	19.53
1897-8	60.08	16.64	1903-4	55.41	18.04
1898-9	59.61	16.77	1904-5	52.21	19.15
1899-1900	57.95	17.25	1905-6	50.19	19.92
1900-1901	54.91	18.21	1906-7	49.5	20.2
1901-2	55.47	18.21			



A Pastoral Scene. South Australian Wool Exports in 1907 were valued at £1,261,000.

This increase in the weight of fleece per sheep is what flockmasters in this State have been consistently aiming at for years, and it is the pride of our stud-breeders that they are able to produce rams and ewes which will give the best results. That growers in other States, also in New Zealand and South Africa, recognise this quality in South Australian stud sheep is proved by the heavy drafts they make on leading flocks each year. South Australian sheep are singularly free from disease.

The Outlook. It is quite a mistaken idea that the area adapted for raising sheep in South Australia is limited, and that we can look for no great expansion in the future. Given a return of fair seasons, the multiplication of facilities such as water supplies in the interior, additional railways (like those projected, north and west), and there is every reason to expect that the unoccupied lands will be gradually taken up and stocked.



Scene on a Northern Sheep Station: a Mob of High-class Merinos.

[A. Vaughan, Photo.]

Economically managed there are millions of acres in South Australia which are capable of profitable occupation. Water conservation and additional transit facilities will one day cause these idle lands to be made highly productive. "Taking all circumstances into consideration," says Mr. Coghlan, the statistician, "it may be fairly estimated that under the present system the States are capable of maintaining, in ordinary seasons, stock equivalent to 390,000,000 sheep—that is, about 180,000,000 sheep, or their equivalent in cattle, more than are now depastured."

A leading South Australian pastoral authority in the course of a public address pointed out that of 318,000 square miles of country "outside counties" 200,000 could be profitably occupied. Of this 200,000 miles, 100,000 will admit of an expenditure of £50 a mile, or of £5,000,000, while the remaining 100,000 square miles will probably profitably admit of an outlay of £2,500,000, being the minimum amount which is necessary for development. This will probably mean an ultimate increase to the flocks of South Australia of 20,000,000. Every million of sheep means permanent employment for something like 500 regular hands on a station. Although occupation is not proceeding as rapidly as could be wished, there is a steady

expansion of the industry and a yearly growth of the flocks of the State. Perhaps the most important points are the wonderful recuperative powers of the pastoral country, the increasing number of farmers' flocks, and the expansion of the fat lamb exports. Those factors are helping the pastoralist and increasing the value of the wool business in South Australia.

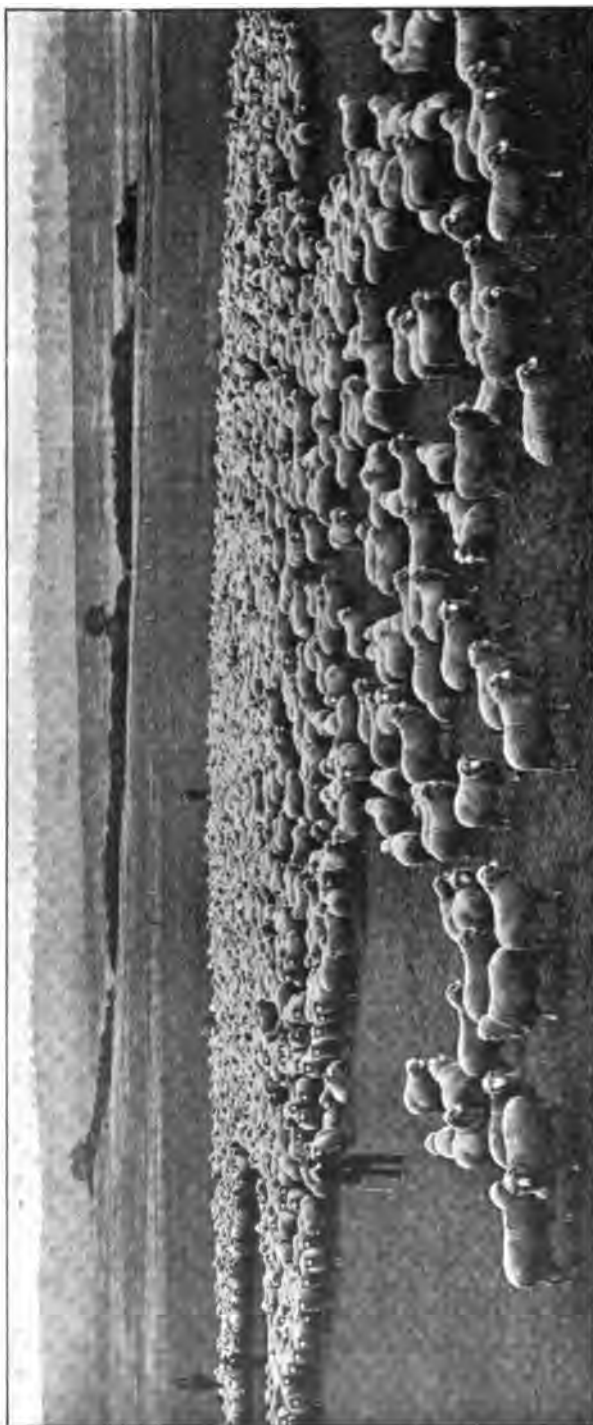
From "Squatter" to "Pastoralist."

It is a truism that the misfortunes which at the time seem hardest to bear are often blessings in disguise. So long as the squatter could carry on in a happy-go-lucky way, and yet make an ample income, it was not to be expected that he would turn his thoughts to the frozen meat trade, or to water conservation on a large scale, to artesian boring, to many other more or less important matters which now occupy his attention. But we have reached the period when the careless producer must go to the wall. Gradually his place is being taken by the pastoralist always on the look-out for improved methods of conducting his industry, who knows that he can only thrive by using his head as well as by undergoing physical privations. Perhaps there is something to be regretted in the change. The old-time



Mule Team Carting Stores to Outlying Stations, Central (South) Australia.

squatter was often a rough diamond, but he was racy of the Australian soil, and not devoid of a certain picturesqueness. The modern pastoralist—the change of designation is of itself significant—has to be a smart man of business. He must be better educated and see further ahead than his predecessors had to look. In short, the pastoral industry is more and more assuming a new character. Principles of the modern counting-house and the banking chamber are driving out the poetry. This was in any case inevitable as the States grew older and were more settled, but the demands of the present position will give the movement a marked impetus. It cannot be doubted that the new responsibilities devolving upon the pastoral lessee entail new responsibilities upon his landlord. If the day of the squatter has gone, so have the times of bitter antagonism between the pastoral tenant and the selector. After much beating about the bush it has been discovered that there is room enough in South Australia for both the pastoralist and the agriculturist, and that there is work enough for both to do without worrying each other by a policy of pinpricks. After many years of negotiations land laws have been adopted which the lessee regards with more favor, while more elasticity has been introduced into the methods of administration. To the capitalist in search of fields of investment, the pastoral industry in South Australia is one which provides scope for capital and opportunity for energy and business acumen.



A Fine Mob of Wethers, Bred in the Far North of South Australia.—They Clipped an Average of 19lbs. 10½ozs. for 14½ Months and 16½lbs. for 12 Months' Growth.

Production and Sale of Wool. The bulk of the wool produced in South Australia is sold in the local market at auction sales attended by buyers who come from all parts of the world. In the season 1906-7 high-water mark was reached with respect to wool shipments and the quantity sold on the spot. The following are the particulars over a series of years :—

Season.	Exports of South Australian Wool.	Quantities Sold at Adelaide Auction Sales.	Percentage of Local Sales.
	Bales.	Bales.	
1900-1	115,774	42,637	37
1901-2	111,676	65,239	58
1902-3	96,524	61,215	63
1903-4	98,484	58,509	59
1904-5	108,838	71,018	65
1905-6	124,472	85,691	68
1906-7	146,431	105,925	72

Weights and Values.

The following shows the average weight of wool per bale in pounds and values per bale of greasy and scoured wool during the last six seasons :—

	Average Weight per Bale.	Value, Average Greasy.	Value per bale, Scoured.
	lbs.	£ s. d.	£ s. d.
1902-3—Greasy	337	9 8 2	—
Scoured	—	—	13 16 5
1903-4—Greasy	348	10 8 7	—
Scoured	—	—	14 0 7
1904-5—Greasy	346	10 2 1	—
Scoured	—	—	11 13 9
1905-6—Greasy	341	10 18 4	—
Scoured	—	—	14 3 6
1906-7—Greasy	338	11 2 3	—
Scoured	—	—	13 14 0
1907-8—Greasy	330	12 12 7	—
Scoured	—	—	15 15 1

The destinations of the wool sold in Adelaide during the past three seasons are as follow :—

	1905-6.	1906-7.	1907-8 to Date.
United Kingdom	40,961	49,973	51,916
France	20,877	25,331	37,705
Germany	8,529	12,540	8,620
Belgium	3,177	4,808	6,921
Italy	—	—	122
America	1,519	1,661	2,344
Japan	—	—	198
Local and Inter-State Scourers and Manufacturers and Speculators	10,433	11,238	11,989
Totals	85,496	105,551	119,815

This table is misleading, in so far as large quantities of wool bought for the United States and the Continent are shipped *via* United Kingdom.

Allowing for small lots of South Australian wool sold in Melbourne, about 86 per cent. of the clip is sold in Australia, and every year the local auctions are expanding, because growers find it more profitable to sell their produce on the spot than ship to London and take the risk of market fluctuation. One of the most important factors in favor of the local auction sales has been the large increase during recent years of farmers' wool—small lots running from one to twenty bales. Mixed farming—wheat and wool—is coming more and more into general use, and the small sheepfarmer is making his influence felt in the local wool market.

About 10 years ago the School of Mines and Industries instituted a class for instruction on wool-classing, at which period the subject was practically dead; but by a comprehensive system of teaching in Adelaide, as well as in the different country townships in centres where wool was grown, enthusiasm was established, and those wishing further instruction were encouraged to go on the larger sheep stations, where arrangements were made with the different squatters to allow the students to handle these large clips. The result of all this work has been that tens of thousands of pounds have been put in the pockets of the large and small sheepfarmers of South Australia. This is only reasonable when the importance of the work is considered.



Wool-classing Students at Work at an Outback Station.

for it is no longer possible to get anything like satisfactory results where the wool is not graded, both on account of the commercial value and the requirements of the different sections of the trade. Mr. G. Jeffrey was the first instructor of the wool class at the School of Mines, and, on that gentleman joining the firm of Bagot, Shakes, & Lewis, he was succeeded by Mr. W. J. Mathews, who is ably carrying on the useful work.

Stud Flocks of South Australia. The breeding of stud sheep has proved a profitable business in this State. Certainly it is one of the most interesting occupations engaging the attention of some of the best and brainiest men in South Australia. The first sheep introduced into Australia were imported into New South Wales about 1788. Although not the first importer of sheep, Captain Macarthur was the pioneer flockmaster of Australia, and from his stud sprang most of the great flocks which have made Australia famous throughout the world as the home of the profitable all-round Merino. During recent years various types of mutton breeds have found favor in South Australia. Shropshire, Lincoln, Leicester, and Dorset Horn studs now exercise an important influence on the rapidly expanding lamb export trade, and no review of stud sheep breeding would be complete that omitted a reference to them.



Typical South Australian Merino: A Hill River Ram, the Property of the Trustees of the late J. H. Angus.

Dealing first with the Merino, it is a singular fact that the stud-breeding **The Merino.** has been in the hands of exceptional men—men who combined stern unbending determination with rare perception and sagacity. According to Darwin, not one man in a thousand has accuracy of eye and judgment sufficient to become an eminent breeder. The Merino flockmasters of South Australia possessed these qualifications to a remarkable degree. More than that, they had faith in themselves and a clear, intelligent conception of the type of sheep they desired to produce. At different periods, when leading Australian breeders were blown hither and thither, like thistle-down in a breeze, by a popular fancy for some new breed, the majority of South Australians paid no heed to the voice of the siren of fashion. They kept steadily onward—practising the delicate and intricate art of in-and-in-breeding; others building up from without, but with the one goal in view. The result is that



South Australian Merinos are Noted for Size and Constitution. This Wether had travelled 300 miles. Its height is 8½ hands. The Pony is 10½ hands.

there is a fairly uniform type of Merino in South Australia—a high-class animal remarkable for constitution, carrying a heavy fleece, long and strong in staple, and commanding top market prices. A Russian expert, who recently inspected many of the leading flocks of Australia, spontaneously declares that the “South Australian stud Merino sheep are the best in the Commonwealth.” It has been my privilege to inspect most of the stud flocks in this State, and opportunities were afforded me at various times of studying the methods of leading breeders, and noting the results obtained. The impression has been strongly conveyed to me that our flockmasters work along scientific lines, displaying remarkable consistency and determination. An animal is being produced in South Australia which is eagerly sought after by sheepfarmers and pastoralists throughout Australia and South Africa, whose aim is to increase the average yield of wool of their flocks. Breeders in Argentina have not yet discovered the South Australian Merino, or they would hardly have failed to obtain a type of sheep which, for constitution and

character of wool, is just what is required to improve the flocks of South America. Efforts have been made to induce breeders here to make a trial shipment of rams to Buenos Ayres; but the demand for regular drafts from all parts of the Commonwealth, New Zealand, and Southern Africa has prevented the experiment being made. A typical South Australian bred Merino is an animal of large symmetrical frame and robust constitution, carrying a heavy fleece, of long staple, showing character, possessing lustre and softness. Artificial feeding is never on any consideration resorted to on the Merino stud farms of this State. The law of the "survival of the fittest" is allowed to work in its own relentless way. The weaklings are not spared by pampering methods.

The Mount Crawford Stud.

Mount Crawford, the property of Mr. Alick J. Murray, is one of the oldest stud-breeding estates in the State. Unquestionably it has proved itself to be the most successful, for at Mount Crawford the late Mr. John Murray, in 1843, laid the foundation of the now famous Murray Merino sheep. It was in this well-favored district that the flock was gradually built up, and it was from Mount Crawford that the additional estates purchased by the founder for



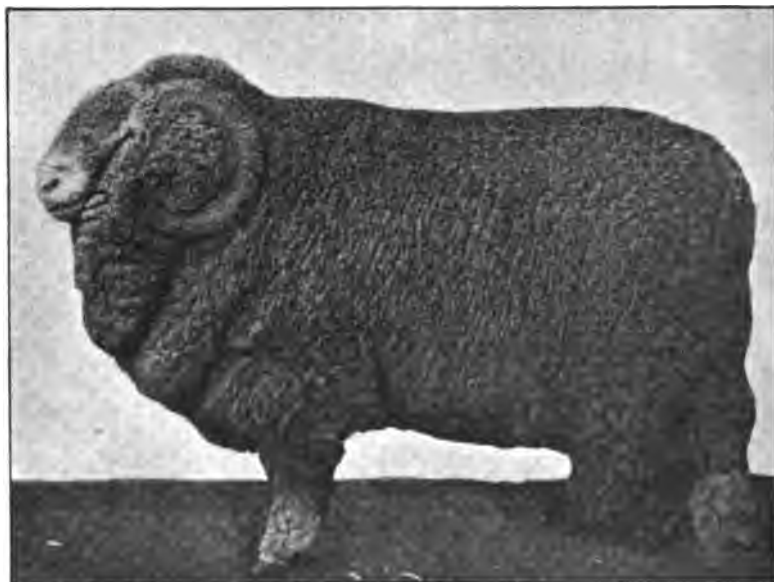
"Lion II.," Bred by and the Property of A. J. Murray.

[Chas. P. Scott, Photo.]

his sons were all stocked. Mount Crawford lies about 35 miles north-east of Adelaide in the high lands of the Barossa Ranges, and the best testimony of the country is that the flocks which have sprung from Mount Crawford are—after more than 60 years' close breeding—unsurpassed in Australia for constitution, size, symmetrical frames, weight of fleece, and uniformity of type. Mount Crawford Merinos are to be found all over Australia and New Zealand, and a number of them have gone to South Africa. At a Christchurch Show in New Zealand Mr. Andrew Rutherford nearly swept the ring in the one and two year old classes both for rams and ewes, and won both champion prize for ram and for ewe with stock by the famous 500-guinea ram, Fame, which he bought from Mr. A. J. Murray. Four hundred culled ewe weaners in the Mount Crawford stud were sold to Mr. George Maslin, of North Bundaleer, in 1902, taken home, shorn in 1902, and 12 months after running on Bundaleer when shorn again averaged 14lbs. of clean wool. The champion ewe, Flora van Senden, won second prize in 1902 at Adelaide Royal Show, first in 1903, and champion in 1903, and won Dalgety Challenge Cup, not only right out, but for the third year in succession.

The Rhine Park Stud.

The Rhine Park stud, the property of Mr. John Murray, was formed by a carefully selected draft from the Mount Crawford flock. From the outset the flock was worked on precisely the same lines as those followed at Mount Crawford, and when, on the death of his father, the present owner came into possession he continued the same system. With the exception of exchanges with his brothers no outside blood has been introduced, and the Rhine Park sheep have won an enviable name for masculinity and all round high qualities. The above illustration is a typical specimen of the Rhine Park sheep. A fleece shown from one of the Rhine Park champion ewes was sent to London some years ago, and the following reports on it were received :—"We have examined the prize fleece with the greatest interest, and may at once say that, of this class of wool, it is the most beautiful specimen we have ever seen. The growth is deep and sound, the staple clear at the root and evenly and compactly formed—a picture of vigor and strength. The fibre is of strong quality, especially towards the skirts, but it is not too coarse considering the great depth of the staple. The condition is light (about 55 per cent. yield) and the appear-



"Admiral," Bred by and the Property of John Murray.

[Chas. P. Scott, Photo.]

ance bright and lustrous. Such wool as this will always command attention, for, of its kind, it is a perfect article.—Helmuth, Schwartz, & Co." "We had the greatest pleasure in viewing this fleece, as we have never had such a perfect specimen under our notice before. Our report on same is that it is a marvellous fleece and perfect in its kind, good length, and remarkable even of staple, of good lustre, and of a yield of about 54 per cent. when the skirts and pieces have been removed. The quality, though near 56/, the best quality of crossbreds, is all the same a desirable and useful one, and is at all times considered by the trade a favorable quality. The fleece is of immense size, and weighed close upon 18lbs., and it was a pleasure to look at it. It was examined by brokers, spinners, and manufacturers, both English and Continental.—H. Anders, Manager Elder, Smith, & Co., Ltd., London."

Rhine Park is situated near Eden Valley, 50 miles north-east of Adelaide, in a beautiful valley where the ridges run down from the high lands of the Barossa Range to the great plain of the River Murray. The country has an attractive appearance, and the climate is favorable to the production of healthy stock.

The Hill River Merinos

This famous flock of South Australian stud sheep was founded over 50 years ago by the late Mr. J. H. Angas, soon after his arrival in the State. In 1845 he purchased some sheep from the South Australian Company, who had formed their stud in 1836 by the importation of a very fine lot of pure Merinos, selected from Leutewitz, Nischwitz, and Oschatz flocks, in Saxony; while, later on, several shipments were brought from Tasmania. About 750 pure-bred ewes were procured from the company; also a very choice lot of stud ewes and rams. Fresh blood was brought in in 1855 from the stud of M. Godin, of Châtillon-sur-Seine, Côté d'or, France; and further importations in following years, including shipments of Spanish Merinos descended from the historic royal flock of King George III. In 1885 the celebrated stud ram "Hercules" was purchased at the high price of £1,207 10s., and in 1887 the champion ram "Cæsar"—both bred by Mr. David Taylor, St. Johnstone, Tasmania. These rams were remarkable for their covering, density, and evenness of fleece, and left a marked effect by transmitting these qualities to their progeny. The density of the wool all over, and particularly the good backs of the Hill River sheep, are, to some extent, due to the judicious use of these high-class sires; and by continued careful selection in breeding, also by the blending of his own stud with selected ewes bred by the late Mr. C. B. Fisher when Mr. Angas acquired the Hill River Estate and live stock, this type of sheep has been brought to its present state of high excellence. The Angas breed, which is so deservedly held in the highest estimation throughout Australasia, and even beyond the ocean, is characterised by low-set, large frames, carrying heavy fleeces of combing wool of the first quality, which realises top prices in the London market, and is highly appreciated by American and other buyers of such wool.

With the exception of the Murray Merinos the Hill River sheep have taken more prizes, including a championship at the Royal Show, than any other studs during the last 10 years.

It is noticeable that the Hill River sheep have scored very consistently in the "Aged" classes at the various shows, and particularly in the class of "Aged Rams." For example, the prize ram "Progress," having won the second prize at the Adelaide Show in 1897, was first at that of the following year; and in several other instances sheep of this breed have won higher prizes as they grow older. These proofs of consistent improvement afford a very valuable criterion of the thriving qualities of the Hill River sheep.

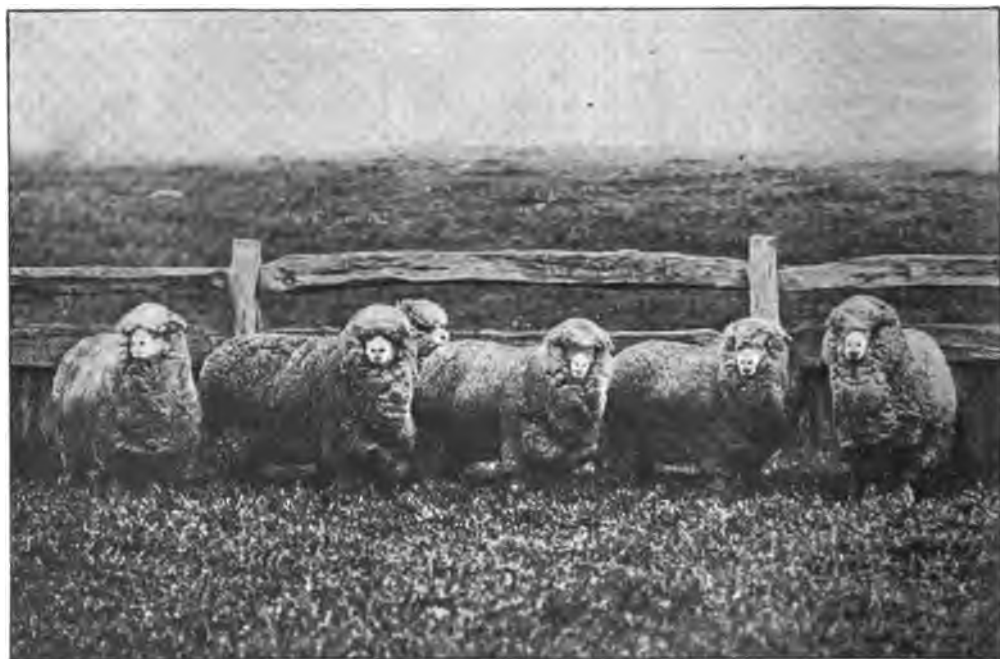
The South Australian Merinos form, in many respects, a type of their own—differing from most of the same-named sheep of Victoria and New South Wales. Perhaps the nearest approach to the South Australian kind is to be found in the Riverina District. The judges of the sheep classes at the Adelaide Show this year, Messrs. A. Austin, sen., and A. Austin, jun., of Lake Bolac, Victoria—names associated with the famous Wanganella flock—were, to judge from their remarks, greatly taken with the South Australian exhibits. Mr. Austin, sen., is reported by the South Australian *Register* to have said that he "believes in breeding sheep that combine the greatest length with the greatest density;" while his colleague in the judging is mentioned as having been greatly impressed with the Hill River sheep shown, and described them "a fine type of Merino, being well-covered, particularly good on the back, with a good staple, and a fine-framed sheep with splendid constitutions." In addition to these high tributes of approbation from acknowledged experts, valuable testimony of the hardy and suitable character of the Hill River sheep for dry and rough saltbush country has been received from various parts of Australia from purchasers of rams of this strain, resident principally in the north-western portions of New South Wales and Western Australia, the south-western districts of Queensland, and along the valley of the Darling River in New South Wales.

The averages of the wool produced by each class of the Hill River sheep are as follows:—Ewes, all ages, 10lbs. 5½ozs.; lambs, 4lbs. 3ozs.; ram lambs, 5lbs. 10ozs.; stud rams, 2-tooth, up to 15lbs. 10ozs.; stud rams, 4-tooth, up to 20lbs. 1½ozs.; stud rams, 6-tooth, up to 19lbs. 8ozs.; stud rams, aged, up to 17lbs. 12ozs. And on the averages Mr. Hawkesworth, lecturer in charge of the sheep and wool department of the Sydney Technological Museum, remarks:—"It must be admitted that the above are great results, and, as the wool is not by any means heavily-conditioned or yolkly, the results are all the more satisfactory."

The Hill River Estate comprises a stretch of fine, healthy, open, undulating grass land, between two lines of hills. The property is situated about 90 miles north of Adelaide, and has an altitude of 1,500ft. above sea-level. Hill River can be reached by rail *via* Farrell's Flat.



Group of Hill River Rams.



Group of Hill River Ewes.

The Koonoona Stud Merino Sheep.

Situated about 90 miles to the north of Adelaide and seven miles south of the Burra is Koonoona, the stud flock of which assists in no small degree to promote the great wealth-producing qualities of the Australian Merino sheep. It is a flock built up upon the lines of maximum wool and mutton propensities. The sheep are fed under natural conditions and are essentially what is known as belonging to the big-woolled, large-framed type. The estate consists of about 30,000 acres of high stony range, low undulating and some flat country, having an annual rainfall of about 17in. It is much exposed, and therefore lends itself to the production of a hardy sheep. The property was originally formed by one of South Australia's pioneers, the late Hon. Walter Duffield, and is now carried on, in the interests of the family, by the trustees, Messrs. Makin, Duffield, and Bullock. Koonoona is under the management of Mr. W. G. Hawkes. The flock numbers about 28,000, but the dry sheep are fed on a northern property, Winnininnie, situated in the saltbush country on the Broken Hill



Stud Ewes, Bred by and the Property of Koonoona Proprietors.

[Chas. P. Scott, Photo.]

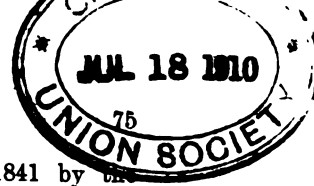
line of railway. This property was recently acquired by the trustees in order to ease Koonoona. The stud proper comprises about 1,800 breeding ewes, but, owing to the rigid system of culling adopted, the whole of the breeding ewes, numbering some 9,000 odd, are of a class approximating closely to stud sheep. It was formed in 1863 upon a small high-class selection of the original Fisher ewes mated to valuable rams from the late Mr. John Murray's Mount Crawford Stud. For many years only the Murray rams were used, and up to the year 1892, from which date until 1902 rapid progress was made under a system of selection from within. In 1902 one of the best Wanganella rams procurable, Warrior VI., was purchased from Mr. Albert Austin at a high figure, this ram being Mr. Austin's leading ram of the Warrior succession. The manager of Koonoona selected this new strain as the only safe one owing to similarity of uprearing for many generations, to mate with Koonoona ewes. The result has realised the highest expectations. The new blood has given a somewhat higher class, denser wool, with no loss of staple and no infringement of the great cardinal virtues of the sheep, viz., size

and constitution. At the recent shearing (1907) the whole of the grown sheep clipped an average of exactly 12lbs. of wool, which sold up to 13½d. per pound in the Adelaide market. They were hand-shorn, and over 6,000 of the 20,000 referred to had only 10½ months wool on. The Koonoona rams are much sought after by runholders in the interior of Australia, and large consignments are sent to the tropical regions of North-West Australia, where a strong, robust staple is such a necessity. The system of farming on the share principle is carried on to some considerable extent on the more favored portions of this estate, and some excellent wheat yields have been obtained. The application of phosphate manures, which this involves, is found to greatly increase the early feed properties of the soil, giving a quick, strong growth whenever the autumn rains are favorable, which withstands the bitterly cold, frosty nature of the winters. Against this, however, and owing to the uncertain character of the rainfall, it is found necessary to proceed cautiously with the plough, and to preserve the bulk of the country and its responsive native, hardy, perennial grasses for the preservation of the sheep in dry seasons. Some idea of the great commercial qualities of the Koonoona sheep may be gained from the accompanying excellent photographs of rams and ewes.



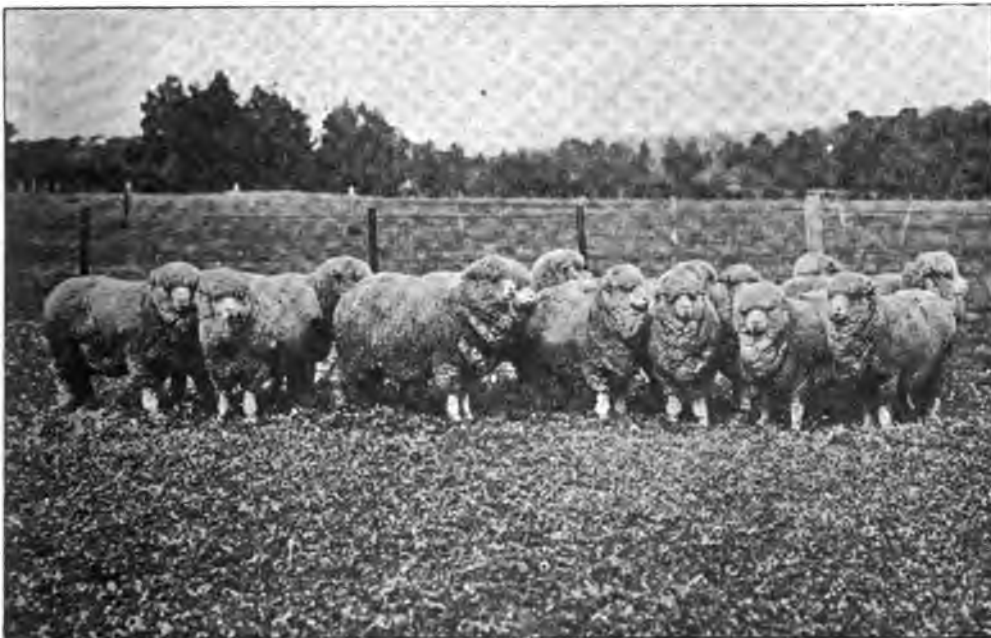
Stud Ram "Centurion," Bred by and the Property of Koonoona Proprietors.

[Chas. P. Scott, Photo.]



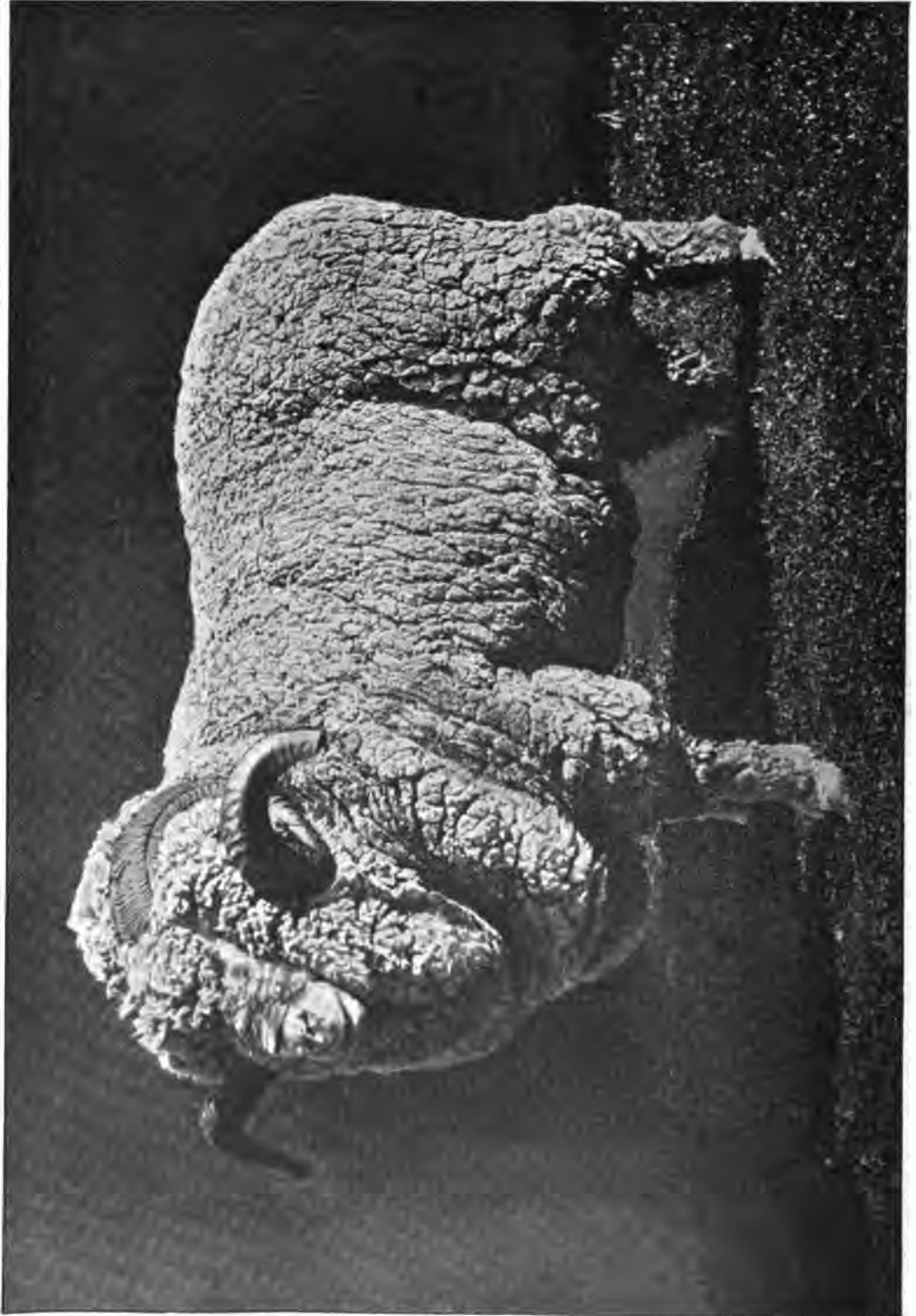
The Hawker Merino (Calcania and Anama Studs).

The Hawker Merino flock was founded in 1841 by the late G. C. Hawker by the purchase of 2,000 ewes, descended from George III. Merinos (the same blood as the Camden House flock) in lamb to Steiger rams. These were bought from a Mr. Icely, of Bathurst, New South Wales, and travelled overland to South Australia. In 1858 five Negrete rams were used, but their progeny was inferior to the Hawker stud sheep, so were discarded from the stud. In 1861 five Rambouillet rams were imported from France; their stock was in every way satisfactory. Mr. John Noble, who then had charge of the stud, described these rams as large-framed, straight-backed, big-boned, robust sheep, well covered with a good fleece of payable wool. About the year 1862 Mr. John Hope made Mr. Hawker a present of one more Rambouillet ram, which proved to be the best of them all, and it was chiefly to this ram that the Hawker Merino owes the position it holds to-day. In 1874 three rams were purchased from the late Mr. John Murray, of Mount Crawford. These did not suit the Hawker Merino ewes, so were discarded. In 1887 an old ram was bought from the same owner, and was used with success in the stud. In 1884 three rams were obtained from Messrs. J. Gibson & Sons, of Scone; and in 1888 three rams were obtained from the Wanganella stud, Riverina. Neither of these strains (Gibson and Wanganella) nicked with Hawker ewes, so their produce was entirely discarded from the stud flock. The flock for 47 years, up to 1901, was under the management of Mr. John Noble, and he established a very uniform type of sheep, in which the influence of the Rambouillet blood is plainly visible. Mr. Noble's first aim was to produce a large frame and sound constitutioned sheep, and then to clothe the large frame with a fleece of robust clothing wool—long and strong, and yet at the same time to stand our dry and arid North. The average weight of the clip of grown sheep is 10½lbs. to 11lbs. per head, according to the season. As surplus sheep sell readily from this flock a large number of breeding ewes are kept (45 to 55 per cent.). As a rule not more than 5 per cent. of wethers are kept. This year the two-tooth stud ewes average 11lbs. 8ozs.; the lambs, 4½ months old, 4lbs. 7ozs. of greasy wool. E. W. Hawker (Calcania) and Walter Hawker (Anama) continue to breed the Hawker Merino. The estates are situated near Clare, South Australia, about 100 miles north of Adelaide.



Hawker Merino Stud Ewes. - E. W. and Walter Hawker, Calcania and Anama, Clare.

[W. S. Smith. Photo.]



"Geoff Rhodes," Stud Merino Ram.—E. W. and Walter Hawker Calceanna and Anama Clars.

[W. S. Smith, Photo.]

The Canowie Stud Flock.

Canowie Station, the property of the Canowie Pastoral Company, lies 130 miles north of Adelaide and 12 miles due west of Hallett Railway Station. The property extends towards Jamestown on the west, adjoins Yongala on the north, Cappeedee on the east, and Booborowie on the south, and comprises some of the soundest grazing area in the State. The climate is hot and dry during summer, and excessively cold in winter, the elevation being about 2,000ft. above sea level. The present holding is approximately 67,000 acres, and about 60,000 sheep are shorn. Canowie sheep are favorably known to Australian sheepbreeders for their massive frames, hardy constitutions, and profitable character. The stud was formed in the early fifties with 200 of the choicest ewes in the breeding flock, and with them were used some imported Spanish Negreta rams, which arrived in 1857. In 1859 the stud flock comprised 500, in 1862 it was 780 strong, and in 1864 it totalled over 1,000. In 1860 the owners decided upon a change of blood, and introduced three French Rambouillet rams, and the result proved highly satisfactory. The Rambouillets gave the sheep large frames, with a long staple of a bold type of combing wool. It is on record that one of these rams lived until he was 14 years old, and his last fleece weighed 13lbs. Since that time the rams used on Canowie have been drawn from their stud flocks.

The breeding flock now comprises 130 stud rams, 1,200 first stud ewes, and 5,000-second studs, 350 selected flock rams, and 17,000 flock ewes.



Flock of 130 Prime Fat Merino Wethers, four years, from Canowie Station, Hallett. Sold at Adelaide, September, 1897. The above Sheep were of extraordinary size, of prime quality (estimated to dress 88-90lbs.), and carried a superior Fleece. In one line these Sheep realised the Record Price of £1 13s. per head.

As an early date illustration of the comparative excellence of the Canowie sheep, it is recorded that in 1875 the proprietors decided to bring these sheep under the notice of the Victorian and New South Wales pastoralists, and entered their sheep for competition at the Victorian Stud Sheep Show held in Melbourne that year. Accordingly, 23 Canowie rams were sent to Melbourne—half way by boat and half way in wagons by road. They showed abundant proof of their rough travelling, but, notwithstanding this, figured prominently in the prize list, and afterwards conspicuously at the ram sales, bringing the top price and averaging 150 guineas for the whole consignment. The result of such enterprise presented a new era for South Australian flockmasters, and a steady demand sprang up for Canowie rams. In 1882 no less than £24,000 was received from sales of Canowie rams alone.

The demand for these rams at the present time is far-reaching—not only within the Commonwealth and New Zealand, but to South Africa as well. The great merit of the Canowie sheep that impresses pastoralists is the general average of the flock, symmetry, and vigor of constitution, combined with covering almost unequalled for length of staple, bulk, and weight of wool.

While the size and constitution remains unchanged, the fleece is denser and finer than formerly; the staple runs about 4in. in length—elastic, soft, and attractive, and full of character, with sufficient body and nature to withstand the heat of the arid districts.

Apart from the stud sheep flocks, Canowie provides much that is interesting to the horse or cattle breeder, as on the station some fine specimens of the Suffolk Punch and Shorthorn cattle (the majority of which are imported animals of special merit) are to be seen.

The Wirra Wirra stud, the property of Mr. Murray Dawson, was formed in 1892, and a splendid foundation was laid with selected rams and ewes obtained by Mr. Dawson from his uncle and neighbor, Mr. Alick J. Murray. The Wirra Wirra property was at one time part of the Mount Crawford Estate. The sheep have been bred in with great care since 1892 with excellent results. Mr. Murray Dawson has sent some splendid representatives of his stud to



Stud Ram, Wirra Wirra.

the Royal Show at Adelaide for many years, and has had the satisfaction of taking a number of prizes in the leading classes for sheep, and also for fleeces. Mr. Dawson aims at producing Merinos of strong masculine characteristics, carrying heavy fleeces of high quality wool. In addition to the Wirra Wirra Estate, Mr. Dawson has a property near Gawler Plains, to where the sheep are taken during the winter. The accompanying photos. illustrate a typical Wirra Wirra ram—a large-framed animal, well-proportioned, and covered all over with a valuable fleece; also a group of handsome ewes, exhibiting great quality throughout.



Stud Ewes, Wirra Wirra.

The Keyneton Merino Stud.

The Keyneton Merino flock, the property of R. R. Keynes, of Keyneton, though not large, is a choice one. It was established 65 years ago by the late Joseph Keynes, the foundation of the flock having been formed by the purchase of sheep from early settlers, including the late John Murray. In 1858 two rams were imported from the flock of A. Steiger, Saxony. Subsequently Murray rams were again introduced. Since 1877 no rams but those bred at



Keyneton Merino Ewes.

Keyneton have been used. The Keyneton Merinos are noted for their robust constitutions, and do well in any State of the Commonwealth, where they are well known. Prizes for fleece have been won at Adelaide, viz :—First prize three rams' fleeces in 1858, International Exhibition, Philadelphia, bronze medal and certificate of award, 1876, and Colonial and Indian Exhibition with Commemorative Medal, 1886. The latter fleeces were from sheep bred by the present owner. Prizes for sheep have also been taken at Angaston, 1858, and Mount Pleasant and Kapunda Shows at later dates. The Keyneton Estate is situated in one of the best districts of the State, where the country and climate are eminently suited for the production of high-class animals with robust constitutions.



View of Keyneton Estate and Homestead.



Mob of Sheep Crossing a Brushwood Bridge.

These two pictures vividly portray the difficulties which confront Australian drovers. A mob of 20,000 sheep was on the road from a remote part of Central Australia to the Adelaide markets. When the drovers arrived with their charges in the "Barcoo" country they found the Cooper Creek—usually a dry watercourse—had been transformed, owing to floods, into a wide stream of water. Retreat was impossible, the advance was cut off, and to remain until the floodwaters subsided was out of the question. That resourcefulness which characterises the Australian bushman was put to a test, and it did not fail the drovers. They built a brushwood bridge one and a half miles long, and over this temporary structure the mob of sheep was driven in single file. Every one of the 20,000 sheep was safely transported to the opposite bank and the long march to Adelaide was resumed.



The Brushwood Bridge Across the Cooper.

Other Types. During recent years considerable attention has been devoted to improving mutton qualities. To this end the Shropshire breed of sheep was introduced in 1888 by His Excellency the Lieutenant-Governor, the Chief Justice of this State, Sir Samuel Way, Bart., who has ever been a practical friend to the men on the land. He acted on the advice of his manager, Mr. F. H. Weston, who confidently predicted that the Shropshire would thrive well in Australia, producing a good fleece of wool, and providing a splendid crossing strain for mutton purposes. That judgment has been abundantly justified by results. The 10 ewes and ram imported by Sir Samuel Way and placed on his Kadlunga Estate thrived so well that success was early assured. Other enterprising men quickly recognised the profitable qualities of the breed. The introduction of the Shropshire had a wonderful influence on the lamb export trade, then attracting attention, and experiments proved that the Shropshire crossed with Merino produced an early maturing lamb of excellent quality, well suited for British markets. Within a few years of the first importation there were quite a number of studs, and a Shropshire Sheepbreeders' Association was formed, the members of which had two objects in view—(1) To breed stud rams and ewes, and (2) to breed rams for crossing purposes. The production of mutton breeds of sheep such as the Shropshire, Lincoln, Dorset Horn, and Leicester has become an important industry in South Australia. With the steady growth of the meat export business, flockmasters find no difficulty in disposing of their annual drafts to farmers, who are beginning to realise the importance of introducing fresh blood into their small flocks at frequent intervals. A feature of the Shropshire breed is its wonderful adaptability. These sheep thrive equally well in the dry climate of our northern districts and in the cold and wet portions of the South-East. They are remarkable "doers," and have exercised a great influence in the promotion of the lamb export trade.



The Shearer at Home: After the Day's Work.

Dorset Horn sheep, imported in 1895 by Mr. John Melrose, of Ulooloo, have well maintained their English reputation. The Dorset Horns are hardy, and well able to develop and keep in condition on our ordinary indigenous herbage; they are exceedingly prolific, twins being frequent, and three lambs not uncommon. They are large-framed sheep, with well-developed bodies and limbs. Nobody supposes that any English breed of sheep will ever supplant the Merino in Australia. Nevertheless, in the rearing of early maturing lambs, their aid is indispensable. Which breed will be chosen will perhaps be decided by local conditions, or even by personal predilections. The Dorset Horn, Lincoln, English Leicester, Shropshire, and the Southdown all have their special claims. The Romney Marsh sheep are coming into favor in the wet districts, chiefly in the south-eastern portion of South Australia. It does not at present seem probable that any one breed is likely to be adopted to the exclusion of all others. A Dorset Horn Breeder's Association was formed early in 1908 for the purpose of forming a stud book, in order to guarantee the purity of the breed.

Stud sheep breeding constitutes an important industry in South Australia, and, with a view to illustrating the type of sheep favored by prominent stud flockmasters, short descriptive particulars are given of leading studs, with photographs of their best sheep. There is a large demand for South Australian rams throughout Australasia and South Africa, and the day is not far distant when flockmasters in Argentina and Mexico will see the wisdom of introducing the South Australian strain of Merinos.

Glenthorne Dorset Horn Sheep.

Glenthorne, the property of Mr. Norman Brookman, is situated at O'Halloran Hill, 11 miles south of Adelaide, and is one of the most compact stud farms to be found in the State. It was once the home of that splendid old colonist and characteristic pioneer, Major O'Halloran, whose name must ever occupy an important place in the early history of South Australia. The estate, which consists of about 2,000 acres, runs from the banks of the Happy Valley Reservoir down to the sea at the Marino Cliffs. The situation is a beautiful one, and Glenthorne gives promise of providing many valuable object lessons to producers and stud-breeders. Mr. Brookman made his purchases of Dorset Horn sheep from Mr. W. R. Flower, of West Staffordshire, one of the leading breeders in England, and the foundation of the Glenthorne Dorset stud consisted of 30 ewes and five rams, imported in 1904. Included in the shipment from Mr. Flower was a pen of three shearlings, which won the first and champion prizes at the Royal Counties and Bath and West of England Show in 1903. The *Live Stock Journal* of London, referring to the sheep purchased by Mr. Brookman, described them as being of "rare good quality and character, of first rank, merit, and type." The owner of Glenthorne has carefully worked along the line of breeding followed by Mr. Flower, and he has had the satisfaction of obtaining excellent



Dorset Horn Ram, Bred by and the Property of Mr. Norman Brookman.

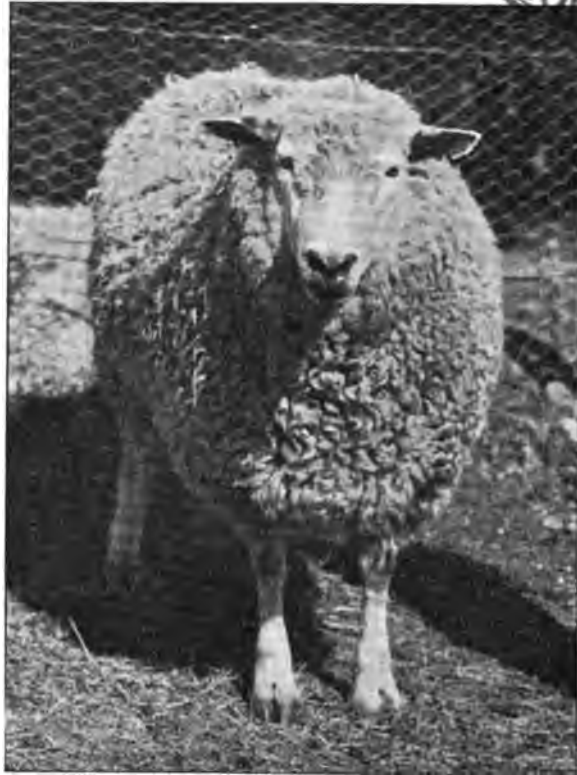
[Chas. P. Scott, Photo.]

results. At the Royal Show for 1907 the judge gave the championship prize to a ram bred by Mr. Brookman, but as the animal was under age, the award went to one of the imported rams, which, in the opinion of the judge, however, had been beaten by its progeny. Although only recently introduced to Australia, the Dorset Horn breed is rapidly coming into favor owing to its splendid mutton qualities, its prolificness, and its hardy characteristics. Crossed with the Merino, the Dorset gives a particularly good lamb, which matures early, and is popular as a freezer. Professor Perkins, in his recent report on the Roseworthy Agricultural Farm flock in 1906-7, remarked—"Early maturity and development is so important a feature in the rearing of lambs that we can readily sacrifice to it at times other points of lesser moment. In this respect the half-breed Dorset Horn lambs appear in our experience generally to run away from any other cross." Mr. Brookman's experience confirms this, and he has found that the Dorset cross produces a lamb of exceptional carcass, carrying meat of fine texture and tasty flavor. The sheep are wonderful doers, are docile and contented. Mr. Brookman recently purchased the whole of the Ulooko stud of Dorset sheep, and has added them to his flock at Glenthorne. Farmers report that they have found that the cross with the Merino gives excellent results, while the halfbreeds do extremely well, the lambs maturing early and being of a hardy nature.



The Merrindie English Leicester Stud.

The Merrindie English Leicester stud flock is owned by Mr. Robert Kelly, and is managed by his son, Mr. W. S. Kelly. The estate is situated near Giles' Corner, in the heart of one of the best of the fertile Midland districts of the State. The Merrindie flock was formed by the purchase of sheep from the noted flock of Mr. Threlkeld, New Zealand, and the animals were selected by Professor Lowrie, formerly Principal of the Government Agricultural College in this State. Mr. Kelly supplemented these purchases from New Zealand by obtaining a few selected sheep from a local flock from imported stock, and he is gradually breeding up a first-class stud of Leicesters. The growing popularity of this type among farmers and large breeders is shown by the fact that this year's drop of rams at Merrindie have been sold in advance. The English Leicester and Merino cross is popular with lambgrowers because of the fine mutton qualities of the progeny. The Leicester is regarded as the "corner stone" of the New Zealand lamb trade, and the breed is coming into favor in South Australia. Not only does the half-bred Leicester carry a long, heavy fleece of wool of splendid lustre, but it has the additional advantage of providing a large carcass of excellent quality. The pictures show "Merrindie," a particularly fine specimen of the Leicester true to type, and three handsome ewes of good frame and high-class quality.



"Merrindie," English Leicester Ram.

[Chas. P. Scott, Photo.]



Stud English Leicester Ewes.

[Chas. P. Scott, Photo.]

Cattle Raising. Tasmania was the chief source of meat supply for a few years after the proclamation, but owing to heavy losses during transit, importations were few and far between. But for the splendid daring of the "overlanders" who pushed their way over trackless mountains and unknown forests, and swam their flocks and herds across the rivers, it would have taken many years to build up the wool and meat industries. As it was the flocks and herds multiplied so rapidly that within seven years boiling down works—the common outlet of surplus years—were established. With the advent of the meat export trade, boiling down works have passed away, never to be re-established. There are other and more profitable outlets for surplus stock. It was on April 3rd, 1838, that the first herd of cattle and horses arrived in Adelaide overland from Sydney. It comprised 335 head, and was in charge of the owner, Mr. Joseph Hawdon, who, during the journey of 10 weeks, lost only four bullocks. To celebrate this important event 90 gentlemen sat down to a public dinner, and an ox chosen from the herd was roasted whole. A snuffbox was presented to Mr. Hawdon in the name of the people of South Australia, and the recipient, in returning thanks, announced his intention of settling in Adelaide "with all the force he could gather." Of the arrival of Joseph Hawdon and Charles Bonney, Mr. Anstey, an old colonist, has written—"Never can I forget the impression made on my mind by the arrival in Adelaide of Messrs. Joseph Hawdon and Charles Bonney, successfully conducting from New South Wales the first overland herd of cattle and horses from the Sydney side. Their arrival was unexpected by us. In those early days of the colony there were no intercolonial posts save at long intervals, and it was the natural desire of the first overland parties organised for Adelaide to keep their journeys with their herds of cattle and flocks of sheep as secret as possible from the public. The news of their arrival spread like wildfire." Mr. Eyre, who subsequently won renown for his exploring exploits, was the second overlander with cattle, and Captain Sturt was in charge of the third party. From that time onwards cattle raising became a profitable industry, and the herds gradually increased, as may be gathered from the following:—

Year.	Number of Cattle.	Year.	Number of Cattle.
1838	2,500	1880	307,000
1840	15,000	1890	359,000
1850	60,000	1900	214,000
1860	278,000	1902	225,256
1870	136,000	1907	325,724

The highest point reached was in 1893, when it was estimated there were 423,000 cattle in the country. The fifties witnessed a marvellous expansion of the cattle stations, but progress was checked when the pastoralist, forced to make room for the pioneer, had to carry on his operations in less favored localities. Cattle-raising on an extensive scale is now restricted to what is termed "outside country"—that is, the saltbush plains of Central Australia and the Northern Territory, where there are extensive runs. There is a vast tract of splendid cattle country in the north of South Australia, only the fringe of which is occupied. Difficulties of transit have hitherto prevented the development of this territory, but with the improvement of stock routes, ranchmen should be attracted to the possibilities of establishing themselves in localities where the rent is low, and where climate and natural advantages are eminently suited to cattle raising. Mr. David Lindsay, the explorer, states:—"Oodnadatta to Charlotte Waters is in the driest belt in Australia, the average rainfall being about 6in.; yet much of it will stand light stocking, and as it is within the artesian water area the precious fluid can be obtained by boring. Including the wonderful nest of springs known as Dalhousie, it should carry, say, 30,000 cattle, besides being an ideal country for the Angora goat. Proceeding northwards the rainfall gradually increases, and we find belts of fair to good pastoral country, with some natural waters—and water can be had by sinking—whilst there are many places suitable for conserving water. This should depasture at least 15,000 cattle. The Macdonnell Ranges, extending east and west of the proposed railway, present a large area of excellent pastoral country, good for sheep or cattle, and magnificent for horses; perhaps unequalled for breeding a hardy type of horse suitable for military purposes. The climate is beautiful. This tract of country should

carry, say, 150,000 head of great cattle. The mineral belt—the development of which awaits the advent of the railway—is, I feel sure, an extensive one of great promise. The district known as Arltunga is already proved to contain payable gold mines; but how can this field be exploited when for over 400 miles the supplies and machinery have to be carried on camels or wagons? Still on northwards, the rainfall increasing at every stage, we pass through pastoral country, capable of carrying, say, 30,000 cattle, to Tennant Creek, which is on the edge of another belt of auriferous country, in which prospectors have found quartz reefs carrying gold in sufficient quantities to be payable with rail communication. Just east of Powell Creek we find the edge of a magnificent pastoral country stretching away to the Queensland border, having many natural waters, and promising to have abundant supplies underground. This belt of country



Fat Cattle Ready for Market.

[A. Vaughan, Photo.]

should carry, say, 900,000 great cattle. Then away to the westward, right over to the border of West Australia, is a large tract of magnificent pasture land fit for sheep or cattle, with, I believe, another belt of auriferous country. This extensive region, which would be served by the railway, is capable of carrying, say, 300,000 great cattle. Newcastle Waters is on the edge of another large area of good pastoral country. At this station at present there are 7,000 fat cattle, but no means of getting them to any market. The whole of the country to the coast would carry stock, say, 200,000 cattle. From the break of the tableland to the coast, a strip of country containing about 100,000 square miles is not only capable of carrying some stock, but is rich in all the minerals, and the soil and climate are admirably adapted for the growth of all products indigenous to those latitudes." Mr. Ernest Favenc, a recognised authority on

Central Australia, states that back from the Powell Telegraph Station to the head of the Nicholson River he found "a large quantity of valuable cattle land, country well and permanently watered. . . . The country on the southern slope is of a nature known all over Australia as being of the best description for sheep. The country drained by the coast rivers is of a different character—better watered, not so well grassed, and only adapted for cattle, with the exception of the Macarthur and the head of the river I called the Parsons. The territory possessed by South Australia, viz., from the sixteenth to nineteenth parallels of latitude, is of a description calculated to invite settlement. The rivers, though rough and not exactly trafficable, are full of large, deep, and permanent lagoons. The country is not suited for sheep, although in these spinifex ridges there is any amount of herbage and vines, which are very fattening for the cattle. In fact, during my various trips across the Territory I have always found that, in even what is known as the worst spinifex desert, there are vines and grasses that horses are always eager for and do well on. With regard to the spinifex country, I should like



Typical Australian Stockmen on Horses and Mules, Stuart's Creek Cattle Station, Far North, South Australia.

to bring under your notice the fact that many people are now recognising the value of these hitherto abused tracts. The spinifex itself is valueless, but the country on which it grows is often rich in different kinds of herbage and vines that alone serve to fatten."

Many years ago the late John Howard Angas imported high-class Shorthorns and Herefords, and established studs, which have since become famous throughout Australasia. Angas Shorthorns and Herefords have taken numerous championship prizes at all the leading Royal Shows. The trustees of the late J. H. Angas are continuing the studs, and fresh importations of high-class animals are to be made from England at an early date.

Considerable attention has been devoted by several breeders to the production of high-class Ayrshires, milking strains of Shorthorn-Jerseys, while splendid specimens of the noted milkers, Holstein-Freisans, have also been imported. The Shorthorn and Hereford breeds are the mainstay of the cattle industry, and some splendid herds of these are to be found throughout South Australia.

The Angas Stud of Shorthorns and Herefords. Probably no breeder of Shorthorns and Hereford cattle south of the line can show a better record of success than that credited to the late Mr. J. H. Angas and to the studs now controlled by the trustees of his estates.

South Australia has been the home of several well-bred studs of Shorthorn cattle during the past 60 years which have won honors at the metropolitan shows in the other States; but the only prominent stud left to-day is the well-known Angas stud. In the records of pure stock husbandry in Australia the most prominent position will be given to the late John Howard Angas, of Collingrove. For a period of over 60 years his life was spent in a close study of pure stock breeding; and, like almost everything else he took in hand, success rewarded his efforts. He was winning prizes at the first shows of the Royal Agricultural Society of South Australia with his cattle, and the exhibits from the same stud more than hold their own to this day in the neighboring States. Many studs of cattle have been formed in Australia by wealthy breeders, but few, if any, remain which have been in existence for more than 30 years. To maintain the leading position for 60 years is a record which is rarely seen even in the home of stud stock breeding—Great Britain.

The late Mr. Angas was gifted with all the talents of a skilful breeder. He laid a sound foundation in all his selections of Shorthorns. In 1884 he founded his celebrated stud by purchasing 20 picked heifers and an imported bull of the Bates breed—a direct descendant of the famous sire "Comet" (155) bred by Charles Colling. These cattle were descended from pure stock imported by the South Australian Company. From that time neither trouble nor expense was spared to improve the breed up to its present high standard. From time to time high-class and costly animals have been added, including several shipments of bulls and cows from England.

Competing for the last 17 champion group prizes offered at Melbourne, the Angas exhibits have won all but four; at the Sydney Royal show they have won all the group prizes for which they have competed, also 26 out of a possible 32 champion prizes for bulls and females. At the last Sydney show (April, 1908) these cattle won first prize in all the classes in which they competed except one, also champion and reserve champion in cows.

Those competent to form a judgment on the point have frequently asserted that Mr. Angas would stand a good chance of wresting the supremacy from the English cattle-breeders were he only permitted a fair opportunity of competing at the agricultural shows in the old country. With a view of sending some of his cattle to England for show purposes, and also with the object of opening up a trade in stud bulls, both Herefords and Shorthorns, Mr. Angas, some years ago, made inquiries through the Chief Inspector of Stock, and subsequently through Mr. John Thornton, the well-known stud stock salesman in England, as to the proper course to be taken. Permission was sought to land animals in England for competition at the Royal and other agricultural shows; but all these efforts were unsuccessful. The English authorities were immovable, their decision being that, were the cattle landed, they would—irrespective of health, or any other considerations—have to be slaughtered a few days after arrival.

In addition to the exceptionally fine herd of Shorthorns the trustees of the late J. H. Angas own a magnificent stud of high-class Hereford cattle. These animals have taken numerous prizes at all the leading shows in Australia. Recognising the value of this picturesque breed as an animal eminently suitable on account of its hardy nature, good feet, and aptitude for travelling long distances, for the far northern portions of Australia in general, and South Australia in particular, Mr. Angas imported in 1869 the Hereford bull "May Duke" (3985), bred by Mr. W. G. Preece, of Salop, and the cows "Lady Wilson," "Stately," and "Winifred." Two years later a bull named "Bruce," bred by Mr. P. Turner, Pembridge, was used in the herd. In 1871 another bull, "Bringewood," (2981), bred by Mr. Price, of Hereford, was added to the stud. Again, at a later date, Mr. Angas purchased from the late C. Price, of Hindmarsh Island, for 200 guineas, the very handsome Hereford cow "Jennie Deans," with her bull calf. This latter animal, afterwards named "Charlie Deans" (5252), won five first prizes and a champion cup in Adelaide, in addition to first prizes at the National Agricultural Society of Victoria's Show in 1881. In 1884 Mr. Angas purchased the two-year-old prize bull "Sir Roger," from Mr. F. Reynolds, Tocal, New South Wales; and a sire more fruitful and more impressive has seldom been seen. A fine string of Shorthorn and Hereford cattle are annually sent to the Melbourne and Sydney Royal Shows by the trustees of the late J. H. Angas.



Angas Stud Shorthorn Cattle.



Group of Angas Stud Shorthorn Cows, Point Sturt, Lake Alexandrina.

The Mount Crawford Jersey Herd.

Mr. Alick J. Murray, of Mount Crawford, owns one of the choicest herds of Jersey cattle in Australia. The great "utility" cow took his fancy some years ago, and the more he studied the records of the island butter-producers the more strongly was he persuaded that they fulfilled all the conditions required by dairymen with whom the production of butter was the first consideration. He laid the foundation of his herd by careful purchases made in Victoria from high-class imported stock. He was fortunate in obtaining possession of Progress III., a very superior imported bull, and this animal stamped his high qualities on the Mount Crawford herds. Mr. Murray also bought several imported cows from the late Mr. Woodmason, of Victoria, and at a later date a bull and two heifers, imported by the Rev. Ralph Brown, were added to the Mount Crawford herd. The most important purchases were made on Mr. Murray's behalf in the Island of Jersey. Messrs. Fowler and De La Perrelle, of England, recog-



"Black Antimony," the Property of A. J. Murray, Mount Crawford.

[Chas. P. Scott, Photo.]

nised authorities on Jersey cows, spent some time among the best breeders and farmers of Jersey Island making these purchases for Mr. Murray. They wrote to him—"We are really proud of our selection, for we do not consider that there has been a better lot sent out to Australia. The older bull is by far the richest that has passed through our hands. We cannot say too much of the younger bull. He is really an almost perfect animal. The heifer is really a picture, and should be an easy prizewinner." This high estimation of the animals has since been abundantly confirmed at the Royal Shows in Australia, where they have taken numerous prizes. The Mount Crawford Jerseys have practically swept the boards at the Royal Shows in Adelaide, and are largely sought after by the stud-breeders and dairymen throughout Australia. All the Mount Crawford Jerseys are descended from cattle in the Island Herd Book. One cow, Maitland Charlotte, yielded 17lbs. 5ozs. of butter in one week, eight and a half months after calving, when grazing in the paddocks on natural grasses. One of the latest additions to the Mount Crawford herd is "Black Antimony," a handsome typical Jersey.

Horse-breeding. Horse-breeding received early attention at the hands of pioneer settlers, and within a few years of the proclamation leading colonists began importing high-class stallions and mares, mostly on the light side. An attempt was made in the forties to induce the Legislature to grant a bonus to the importer of the best animals in a given period suitable for "cart and farm work," but this form of State aid was not resorted to. High-class stock was imported by leading breeders at various periods. South Australia is the natural home of the horse, climate and herbage being unequalled in aiding the production of a hardy animal. The horses bred in the far northern parts of this State are wonderfully staunch, and are good "doers." They are capable of making long journeys without shoes on a minimum supply of water and feed. Astonishing feats of endurance are recorded in favor of the South Australian bred horse accustomed to the stony



South Australian Bred Horses.

[A. Vaughan. Photo.]

saltbush plains of some of the north country. Stuart, the explorer, on his great trip across the continent, used northern-bred horses, and they carried the party long stages day after day. Only one animal was lost on this arduous journey.

Captain Creswell, C.M.G., for some years interested in horse-breeding in northern Australia, in a report to the Indian Government on the advisableness of establishing breeding stations in Australia to provide supplies for the remount service, wrote:—"In Australia the horse in the bush, and on nearly all runs, 'cuts his own grass'; he is, in fact, 'allowed nothing a year to find himself.' To realise how exceedingly well he 'does himself' on this small allowance he should be seen and ridden. On cattle runs, where a day's muster and 'cutting-out work on a camp' is as hard as any day's hunting, he gets nothing but the grass he picks up for himself. They are worked off the grass continuously for a fortnight or three weeks—not all cattle-mustering days; that goes without saying. Far the greatest number have never had a mouthful of

any fodder in their lives. One very fine old warrior of mine literally starved in the stable for two nights, refusing to eat good corn and wheaten hay out of a manger. Used to a free life in the open, his legs were the only portions of him that 'filled,' yet he carried me home 70 miles, and 'reefed' at his bit for the last half-mile canter to the home paddock gate. The fattening and growing qualities of Australian grass are really wonderful. I have seen many fat horses brought in from the 'run,' but I shall never forget the condition of two we chanced upon when exploring on the tableland which lies to the west and south-west of the Gulf of Carpentaria. They were masterless exiles, the property—we found out afterwards—of an unfortunate who had been killed by the blacks 18 months before. They were so pleased to meet some of their own kind again after such a long solitude that they ran in amongst our spare loose horses, and we caught them and hobbled them as easily as our own. One of our party thought he would take a turn out of one of them the next day, and accordingly saddled him. The 'going' was certainly sticky after rain, but less than two hours was more than enough for this obese animal, and he simply laid himself out at full length, quite pumped out and done up. They would have taken prizes in a 'fat gelding' class at Smithfield, and their coats—like all horses on good grass—shone like satin. It is from these parts—the Northern Territory tableland, where horses on nothing a year can do themselves so very well—that the Indian army should draw its horse supply. The most weighty objections to a reserve store of horses, viz., fodder, grooming, and attendance would weigh nothing here. The writer was out on the country with the first men who took their stock there, and well remembers their delight with those splendidly grassed rolling downs and plains on the vast tableland. Occasionally broken by a wooded ridge or belt of timber, the downs stretched away for mile upon mile, as far as one could see." For a time little attention was paid to horse-breeding, owing to the low prices ruling; but with the increasing demands from South Africa and for the Indian remount service the industry has been revived. During recent years a great improvement has taken place in quality, and further efforts are being made to produce the right stamp of animals. During 1902, 2,400 horses were exported, of a value of £53,000. Frequent drafts are sent to India, Java, and South Africa.

The Australian turf owes much to the enterprise of early South Australians. The high standard in the thoroughbred classes up to the eighties was largely due to the influence of South Australian horses. Some writers have hastily given the whole credit to breeders in New South Wales, but a careful perusal of the turf statistics between 1850 and 1880 will go far to convince the unprejudiced that the turf is chiefly indebted to South Australian enterprise. Breeders have introduced a great line of stayers. The Messrs. Fisher, of South Australia, did a lot for the industry in Australia. The famous "Fisherman" first trod South Australian soil. Then the name of Gerrard stands out prominently as a benefactor of the turf, as he introduced, among others, "Talk o' the Hill" and "Ace of Clubs." Sir Thomas Elder imported "Gang Forward" at a cost of over 4,000 guineas in 1876, and it is generally admitted there is no assessing the value of the mares got by the great Stockwell horse.



"Rendelsham Collegian," imported, the Property of
Mr. Norman Brookman.

[Chas. P. Scott, Photo.]

During the seventies the thoroughbred class was particularly strong, and nearly every settler commanded two or three blood mares as part of his stock. The success of the early South Australian breeders was largely due to their judicious choice of sires. During 1877 an effort was made to form a stud company for the purpose of establishing horse-breeding stations, but nothing came of the scheme. The honor of introducing the first thoroughbred stallion rests with the late W. S. Whittington, who in 1840 brought out from England "Acteon" and the thoroughbred mare "Falkladina." They afterwards figured prominently in the stud of the late John Baker, of Morialta. As early as 1839 a lot of mouse-colored Timor stallions, all pure bred, were brought down from their volcanic pastures by Captain Hughes.

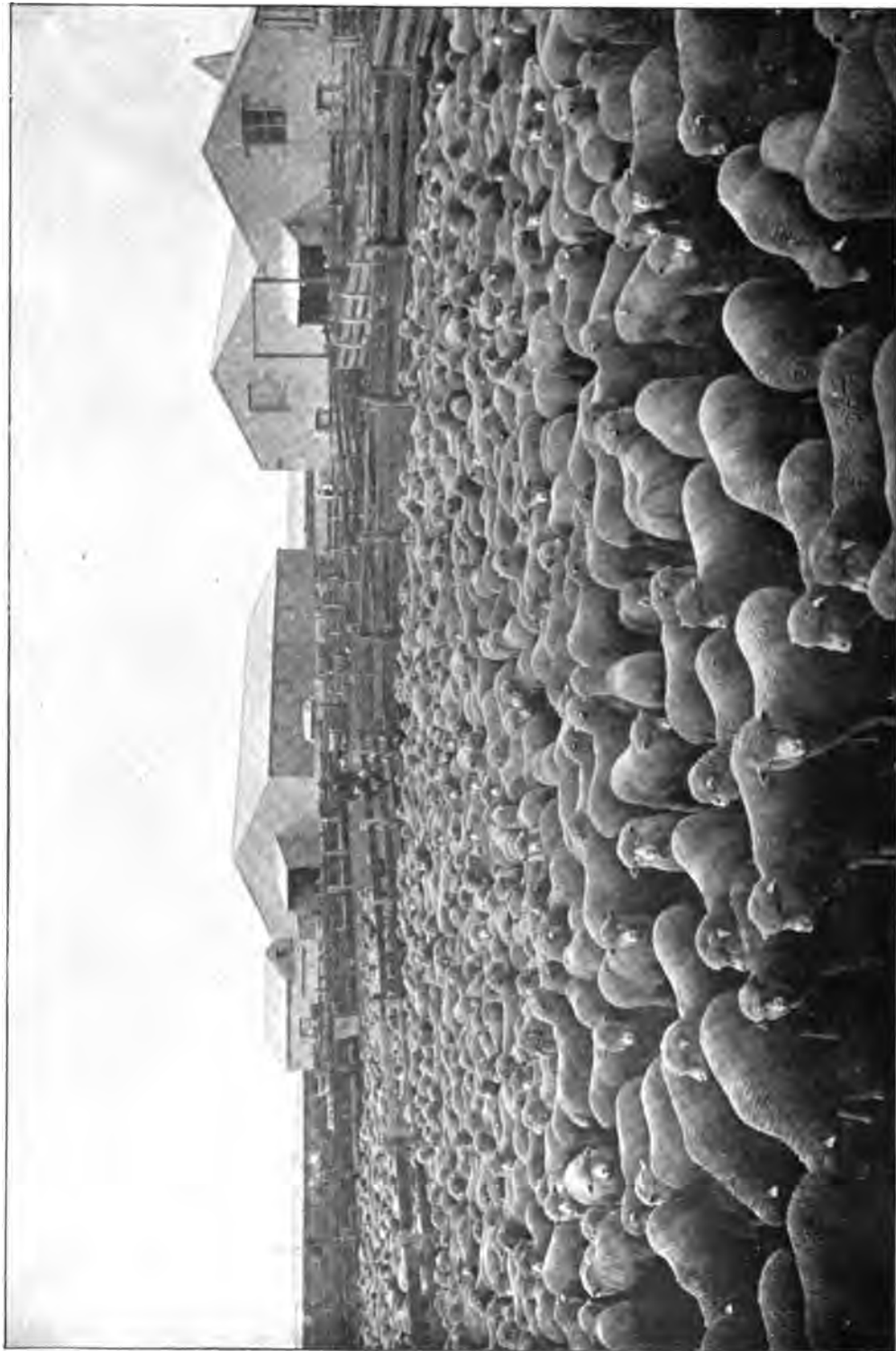
Sir Thomas Elder, the late John Howard Angas, Mr. Charles H. Angas, the Proprietors of Canowie Estate, and the Hon. George Brookman have done yeoman service for the State at different times in introducing and breeding high-class horse stock. Attention has also been devoted to the heavier classes, and some fine specimens of the Clydesdale, Suffolk-Punch and pony breeds are now to be found in the State, while Sir James Penn Boucaut has ably advocated the Arab breed, and has imported some fine animals.

It is estimated that there were 206,000 horses in South Australia on March 31st, 1907. compared with 180,000 in 1897.



Parade of Prize Winners at the Royal Agricultural Show, Adelaide.

[W. S. Smith, Photo.]




CHOICE LAMBS READY FOR FREEZING FOR EXPORT TO LONDON MARKET.

Bred by T. R. & A. P. Bowman, at Campbell House Station, Lake Alexandrina.

(W. S. Smith, Photo.)

CHAPTER IX.

THE LAMB - BREEDING INDUSTRY.

T was Charles Dickens who once remarked, at an agricultural dinner, that "the field which paid the farmer best to cultivate was the one within the ring fence of his own skull." That statement contains a more important truth to-day than it did in the time of the great novelist. Science is conspicuously aiding the tiller of the soil who places himself in a position to be assisted. Improved ocean transit has brought the producer in Australia and the consumer in the centres of population in Europe closer together, and the refrigerating chamber is providing almost unlimited opportunities for the expansion of trade. The remarkable success which attended the experiments made in New Zealand in the shipment to England of frozen meats compelled Australian breeders to look askance at the "boiling down" works which were employed for the purpose of dealing with surplus stock in times of plenty, and relieving the pressure when droughts came. With a threatened scarcity of feed and water before them, pastoralists were sometimes forced to sacrifice their stock in a full market. Sheep used to be killed for the sake of the skins, and the carcasses either left to rot on the ground or sold for a few pence per head to the owner of the nearest boiling down works and turned into tallow. The advent of the freezing process and the refrigerating chamber in the ocean steamer altered all this, and the day of the "boiling down" works passed away never to return. The results obtained in the land of the Maori suggested to enterprising breeders in South Australia the need of introducing types of English mutton breeds of sheep. These were wanted for the purpose of crossing with the hardy Australian Merino, which had hitherto been raised chiefly from a wool point of view. Breeding lambs for export followed closely on the importation of the typical mutton types of sheep. A gratifying feature in connection with this industry was that from the outset farmers rather than pastoralists went into the business. This led to the multiplication of farmers' flocks, and the innovation has had a marked effect, not only on the agricultural industry, but upon the wool trade. The introduction of sheep to the farm was the means of directly increasing the producers' resources of revenue on the one hand whilst improving his methods of cultivation to his general advantage. The wool trade benefited to a considerable degree; the steady increase in the number of sheep within hundreds largely compensating for decimation caused in the flocks of pastoralists in the outside country. During recent years there has been a large increase in the flocks within hundreds, notwithstanding the increasing number of carcasses sent away. The local wool sales are largely assisted by the small lots of wool sent in by farmers who keep sheep mainly for the purpose of breeding lambs for the export trade.

Removing Objections.

Early in the nineties attention was directed to the advantages which would be likely to follow the erection of freezing works. Leading pastoralists were sceptical. They gave three main reasons for not joining forces in order to follow the example set by New Zealand. First, that a continuity of the supply was uncertain under conditions then existing. It was pointed out that local consumption took all the sheep that were in any degree suitable for export, and "surplus" supplies would have to be imported. The second objection was that the right kind of animal required for freezing was not bred; and thirdly, that the bulk of the country was not adapted for the carrying of the large-sized mutton breeds. All three objections have been removed. There is a "continuity of supply" from sources undreamt of 10 years ago. The "right kind" of sheep are now bred in various parts of the State, and a large portion of the country has been proved to be eminently suited for the raising of animals that meet with ready approval in England. The grass-fed lambs of South Australia mature earlier than do those grown in any other part of the Commonwealth, but efforts are being made to supplement the natural

grass by the growing of fodder crops. By the cultivation of lucerne, rape, kale, and other fodders the business of growing lambs for export is capable of considerable expansion on profitable lines. In every respect the South Australian article is equal to the best that are shipped from any other State.

Breaking New Ground. The first practical attempt made in South Australia to establish freezing works was in 1894. It was my privilege to become possessed of information concerning what had been done in New Zealand. Valuable facts were tabulated and brought under the notice of sheep-owners, merchants, and capitalists. Whilst without exception they were impressed with the wonderful results which had been obtained in New Zealand, the objections already stated were put forward as reasons why South Australia could not hope to make a success of the business. Eventually I was invited by several gentlemen, who began to realise that something had to be done, to draw up



Corner of State Freezing Works, Port Adelaide.—Frozen Lambs Ready for Shipment to London.

[A. Vaughan, Govt. Photo.]

a prospectus for a company. Because of its historical interest in connection with the frozen meat trade, in view of the developments which have taken place, a summary of the document, which represents the first practical effort to introduce what is now an important industry, is given in response to requests that it should be placed on record. The company was to be called the "South Australian Freezing Co., Limited," and the capital was fixed at £10,000. The "objects" set out were—"1. To establish a butter factory and produce stores in or near Adelaide. 2. To establish freezing works and cold stores at Port Adelaide. 3. To receive and forward to Australian, British, and foreign markets butter, bacon, pork, beef, mutton, poultry, rabbits, eggs, cheese, wine, fruit, and other farm, dairy, and garden produce, frozen or otherwise. 4. To arrange for the sale and distribution of produce in London and other populous centres. 5. To provide local outlets for produce of all kinds and in any quantity. 6. To improve the quality of produce and the methods of placing it before consumers. 7. To assist farmers and

others to start creameries, &c. 8. To minimise the present high charges to which producers are subjected. 9. To bring producer and consumer into closer business relations. 10. To act as salesmen and forwarding and commission agents." It was further stated—"It is proposed that the freezing works and cold stores at Port Adelaide shall be placed afloat, and so obviate the heavy lighterage and other incidental charges now paid by producers. The provisional directors are in possession of special advice as to the construction of these floating freezing works and cold stores, and believe that some of the latest and best machinery is immediately available." The prospectus also said—"The successful development of the colonial produce trade in the future depends upon the ability of producers to compete against keen and well favored rivals in quality and price. The company will seek to make available for producers and shippers the most approved means for enabling them to participate, on a remunerative basis, in this trade to an ever-increasing extent."

"Private Enterprise" Apathetic.

In the light of experience there are portions of the foregoing which would now be modified, but it represented at the time the best scheme that could be devised on the basis of the information then available. The apathy of stockowners, the indifference of merchants, and the timidity of capitalists proved obstacles too great to be overcome. The promoters were in earnest, and some progress was made, but the company was never formed. A year or two elapsed, and during that period the demand for some establishment for dealing with perishable produce on its way from the farm to the refrigerating chambers of the ocean steamer became more and more apparent. An attempt to promote private freezing works in the South-East met with no better success than did the efforts which had been put forward in the city. With private enterprise holding back—exhibiting indeed considerable scepticism and apathy—and producers demanding better facilities, the State stepped in and the Government Freezing Works were erected at Port Adelaide.

The State Produce Export Department.

The establishment of the Government Produce Export Department, on the 17th April, 1895, may be said to have opened up a new and prosperous era to the producers of South Australia. The development of the frozen meat trade has revolutionised the methods of sheep husbandry. The original freezing chambers were erected when the outlook was becoming serious to producers, because of the decline in prices of produce and the want of a market for the disposal of surplus stock. The original aims of the Government in building works were—(1) Give opportunities of opening up overseas markets for the products of this State not then being shipped. (2) The development of the production of minor perishable products; and finding new markets for these increased productions. In order to properly carry out this work a London Depot was established, and while this may be said to have been for a time a movement for the benefit of winegrowers particularly, the Manager, sent from Adelaide, was instructed to also deal with other lines of produce, and it was through this depot that the first experimental shipments of produce were sold. The depot was eventually sold in 1903 to a private company, who undertook to continue the wine trade along the lines the Government had adopted, and so that the Government should have a proper supervision of the marketing of South Australian produce in London, a Commercial Agent was appointed in 1906, and by his special attention to the English requirements of the present day some very valuable information has been received and distributed amongst growers. The services of the Commercial Agent are also employed in extending trade with the Continent, and in advertising the State by making exhibits of our products at the leading shows, &c., throughout England, besides having a permanent and up-to-date exhibit in a special show-room connected with the Agent-General's suite of offices in London. In addition to the lamb trade, the Department has shipped large quantities of butter. In 1893 the Government of the day provided a bonus on all butter coming up to a required standard and shipped to overseas markets from South Australia. This bonus firmly established the trade, and while only 16 tons had been previously shipped, in the next two years 766 tons 7cwts. were sent forward, on which the Government paid a total bonus of £11,508 17s. 3d. The bonus was refused on only 57 tons of the butter offered for shipment.

Since then the trade has fluctuated through the vicissitudes of the various seasons, but a record for the State was established last year, the total shipment to London amounting to 876½ tons. The resources of the State have by no means been yet exhausted, and dairying is making rapid strides, with the result that in average seasons exports will expand until our figures are doubled and doubled again. The Department has also paid attention to the development of the fruit trade. South Australian apples hold pride of place amongst all Australian apples sold on the English markets. Great care has been taken by the majority of shippers to uphold their reputation, and with stringent measures to preserve this reputation there is every prospect of not only increasing our output for the United Kingdom, but the Continent is gradually becoming one of the largest customers. Rabbits have been shipped for years, and while the trade is firmly established, shipments vary considerably in sympathy with the fluctuations of the prices obtainable in England. During the last 12 months a forward movement has been made in obtaining markets in the United Kingdom for South Australian honey, eggs, and poultry. Success depends entirely upon the ability to produce the right quality for European requirements, at a cost that will enable producers to profitably sell at prices that are now ruling in



The New State Freezing Works in course of Erection at Port Adelaide.
They adjoin the present Depot.

London for these goods being put on the market from foreign countries. Experimental shipments of eggs and poultry have proved so successful that arrangements are now being made for extensive shipments during the coming season, and the Commercial Agent in London reports that he is quite confident that he can obtain paying sales for South Australia.

Lambs as a By-Product.

Producers have tasted the sweets of a profitable branch of the export produce trade, and it is not likely that further opportunities of promoting it will be neglected. Certainly the same undercurrent of apathy and in some quarters active opposition which characterised the early days of the lamb trade are not likely to recur when new departures are suggested. Brains more than anything else are required in the development of the natural industries of Australia. The resources exist. In order to tap them and turn on a stream of prosperity into private and national channels, the primary producer and those who fill the gap between him and the consumer in the old world must work intelligently and exhibit enterprise. Knowledge is power; it is also profit when properly directed in the by-ways of commerce. As a by-product of the farm lambs for export are proving highly remunerative, and the future of

this steadily expanded industry is assured. The value of the trade can be realised when it is pointed out that in years before the export trade was inaugurated, although the productions of fat lambs was infinitesimal in comparison with present conditions, in the glut of the season they were hard to sell at 5s. or 6s. each. At the present time there is no possibility of a glutted market, and the approximate standard value is at least 10s. per lamb, while the department last year returned growers as high as 16s. each for lambs shipped for sale through the Commercial Agent in London.

Freezing Accommodation. The Government, recognising the growing importance and requirements of the trade, has decided to double the present capacity of the works, which will give accommodation for the treatment of 8,000 lambs per day. Extensive works are in course of erection at Port Adelaide.

Exports. The following table shows the number of carcasses sent away from South Australia yearly since the inception of the trade in 1895:—

	Lambs.		Total.	Mutton.		Total.	Season's Total.
	Depot.	Privately.		Depot.	Privately.		
1895-6	1,751	—	1,751	1,097	—	1,097	2,848
1896-7	10,606	—	10,606	675	—	675	11,281
1897-8	3,534	—	3,534	463	—	463	3,997
1898-9	38,620	—	38,620	2,052	—	2,052	40,672
1899-1900	89,980	—	89,980	1,334	—	1,334	91,314
1900-01	94,597	—	94,597	7,122	—	7,122	101,719
1901-2	45,440	47,134	92,574	—	—	—	92,574
1902-3	63,798	53,045	11,6843	19,464	18,656	38,120	154,963
1903-4	64,930	91,436	156,366	10,521	10,390	20,911	177,277
1904-5	155,858	37,822	193,740	2,254	311	2,565	196,305
1905-6	161,066	66,317	227,383	—	—	—	227,383
1906-7	163,819	87,750	251,569	2,613	434	3,047	254,616
1907-8	198,687	72,942	271,629	4,490	—	4,490	276,119
	1,092,686	456,446	1,549,192	52,085	29,791	81,876	1,631,068



CHAPTER X.

THE AGRICULTURAL INDUSTRY.



FOR many years South Australia was known as the granary of Australia. That title was legitimately earned, this State having been the first of the Australian group to export breadstuffs on a large scale. At the outset the pioneers hung about the city, fearing to break away from the companionship of shipmates—doubtful if the land available would repay cultivation. For some time a wrong impression prevailed concerning the quality of the soil on the Adelaide plains. Even Captain Sturt was misled by the parched appearance of the country. When delivering a lecture to the settlers in 1838, he remarked—“If you attempt to cultivate the land around Adelaide you will be grievously disappointed. You must not expect to get crops of grain or fruit on this side of the ranges.” Within three years of the delivery of that address sections on all sides of the city were yielding 30 and 40 bushels of wheat to the acre! Breadstuffs were imported from Tasmania, and at one time flour was sold up to £100 per ton in Adelaide. Cereal growing was a pronounced success from the start, and in this branch of industry progress continued by leaps and bounds for many years. The population, exclusive of Northern Territory, shipping, and aborigines, in 1891 was 310,426, and at the census of 1901 had increased to 354,001, an addition of 43,575 persons, or 14 per cent. During the same period the area under cultivation had increased from 2,649,098 acres to 3,279,406 acres, an addition of 630,308 acres, or 24 per cent., as compared with an increase of 3 per cent. during the preceding decade, 1882-91. There were 9.0 acres of tilled ground per head of the population, as compared with 8.4 acres at the date of the census of 1891. The following table shows the area under cultivation in each division in South Australia at the date of the census of 1881, 1891, and 1901 respectively, and the increase or decrease respectively :—

Division.	1881.	1891.	1901.	Increase or Decrease.	
				1891 on 1881.	1901 on 1891.
Central	931,783	894,593	1,152,340	— 37,190	+ 257,747
Lower North	822,615	967,627	980,536	+ 145,012	+ 12,909
Upper North	699,391	665,479	841,036	+ 33,912	+ 175,557
South-Eastern	90,313	73,085	97,784	— 17,228	+ 24,699
Western	29,802	48,314	207,710	+ 18,512	+ 159,396
Total	2,573,904	2,649,098	3,279,406	+ 75,194	+ 630,308

Bringing these figures up to latest date, it must be mentioned that the population of the State proper at March 31st, 1907, was 381,797, the increase on the number when the census was taken in 1901 being equal to 7.85 per cent. The land under cultivation at the same date was 3,239,891 acres, a decrease of 39,515 acres, or 1 per cent.

These figures would at first sight convey the impression that with an accession of population less attention has been given to the cultivation of the soil. The real reason of the decrease which has been shown, however, is the tendency of recent years to allow land in the “outside” country, where the rainfall is light, to be devoted to a much greater extent to mixed farming. Nature never intended that wheat should be regularly grown on such



(CH. X.)

A FARM SCENE.

[Chas. P. Scott, Photo.]

A TYPICAL HARVEST SCENE ON A SOUTH-EASTERN FARM.



Ernest Gall, Photo.

The climatic conditions of the south-eastern portion of the State are much wetter and cooler than the main cereal-growing centres. Here barley and oats take the place of wheat to a large extent; the crops also ripen much later, and the stripper is replaced by the binder and the steam-thresher in the harvesting operations.

areas, and so to-day farmers are making a much better living by "spelling" their land, cultivating less, and going in more largely for sheep and dairy cows. At the same time everywhere within the regular rainfall area cultivation has increased, and in spite of the great impetus which has been given of recent years to the frozen lamb industry, the farm lands of the Lower North and Central districts were never put to such good use, regarding the matter from a purely agricultural point of view, than they are at present. Emphasis will be given to these remarks if comparison is made of the cultivated area of the State by divisions at the last census and at latest date. This is done in the following:—

Division.	1901.	1907.	Increase or Decrease. 1907 on 1901.
Central	1,152,340	1,192,609	+ 40,269
Lower North	980,536	1,044,671	+ 64,135
Upper North	841,036	585,886	- 255,150
South-Eastern	97,784	151,826	+ 54,042
Western	207,710	271,843	+ 64,133
Total	3,279,406	3,246,835	- 32,571

The following statement shows the area of the State, also of the several divisions referred to, of the land wholly or conditionally alienated, of Our Landed Estate. Crown leases, and of the total occupied:—

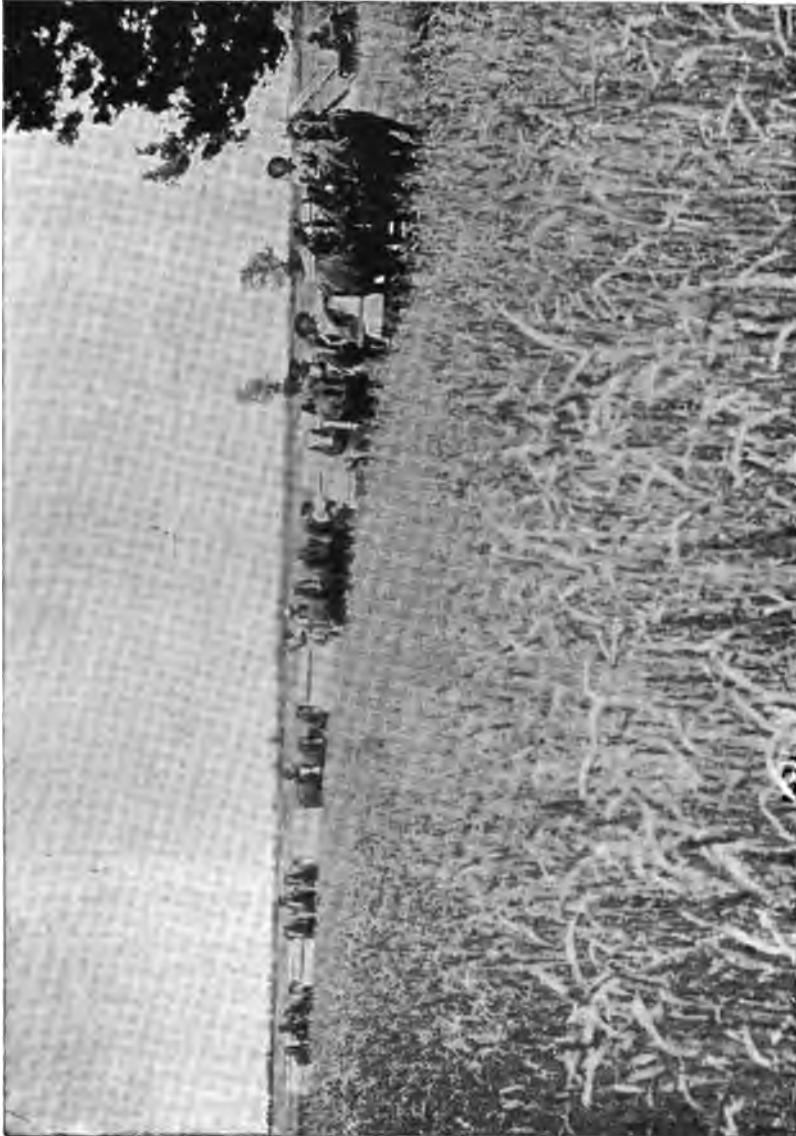
Division.	Area.		Occupied.		
	Square Miles.	Acres.	Alienated.	Crown Leases.	Total Acres
I. Central	13,891	8,890,240	Acres. 3,302,298	Acres. 3,797,442	7,099,740
II. Lower North	12,401	7,936,640	2,494,907	4,420,445	6,915,362
III. Upper North	14,065	9,001,600	916,435	7,487,694	8,404,129
IV. South-Eastern	15,585	9,974,400	1,572,043	4,356,528	5,928,571
V. Western	24,511	15,687,040	282,693	6,506,221	6,788,914
Total counties	80,453	51,489,920	8,568,376	26,568,340	35,136,716
Remainder of State	299,617	191,754,880	1,129	67,579,569	67,580,698
Total South Australia	380,070	243,244,800	8,569,505	94,147,909	102,717,414
Northern Territory	523,620	335,116,800	473,279	103,280,346	103,753,625
Grand total	903,690	578,361,600	9,042,784	197,428,255	206,471,039

There is inspiration here for those who like to study large maps and think "continentally," as well as scope for the active pursuit of agriculture in all its varied branches.

From the foregoing figures it will be seen that, roughly speaking, one-half of the area of the State proper is in occupation. By occupation is meant land which has gone out of the possession of the Government, either by sale or lease. To what use all of it is being put cannot be exactly said; but it is fair to assume that, even if only occasionally and to some extent, the whole has been acquired with the object of utilising it for profit. The remaining half of the State is still in the hands of the Government, and, being unoccupied, is making no contribution to the collective wealth. Of unoccupied country 231,363,175 acres are in the Northern Territory, 124,174,182 acres outside of proclaimed counties in South Australia proper, and only 16,353,204 acres within the settled parts included in counties.

Interesting Natural Features.

Reference to the divisions into which the State is for statistical purposes divided will be meaningless to the reader across the seas unless accompanied by some statement of the outstanding features of each from an agricultural point of view. The Central Division enjoys a temperate climate, with a reliable rainfall varying over a number of



Stripping Wheat at Loxton's on the River Murray.

years from 42in. to 16in. in the hills and plains respectively, 21in. being the average fall at Adelaide. The Lower North also has a temperate climate, but an earlier season by some weeks. There is a fair rainfall, averaging from 13in. to 25in. according to the level of the country. Two mountain ranges stretch from south to north, with broad, well-watered plains of exceptionally good arable land intervening. Some of the tableland is 1,500ft. to 2,000ft. above sea level. It possesses the advantage of being the nearest agricultural land to the Broken Hill mining

district, with which it is connected by rail. The Upper North contains a large proportion of country popularly known as "beyond Goyder's line of rainfall," where the climate is hotter and drier, the average rainfall in the farming districts approximating 12in. to 15in. The country chiefly consists of extensive plains, with low rises and little surface water. To the eastward much is tableland considerably above sea level, with a consequent lower temperature. The South-Eastern Division comprises all the country east of the River Murray as far as the Victorian boundary, and on the south extends to the Southern Ocean. The climate is colder and the rainfall heavier than in any other part of the State, with the exception of the Mount Lofty Range. The land is low-lying, with isolated hills or ridges. Large tracts are now being drained. The Western Division is confined to lands within counties adjacent to the west coast of Spencer's Gulf and that portion of the southern coast lying between Port Lincoln and Fowler's Bay. It has an equable climate, and an average coastal rainfall of 20in. It may be mentioned



Threshing Wheat and Baling Straw at Roseworthy Agricultural College.

[R. K. Lawrence, Photo.]

that the large island known as Kangaroo Island, lying across the entrance to St. Vincent's Gulf, is included in the Central Division. As will be seen by visitors approaching the State by sea, either from the east or the west, the height of the island above sea level and its proximity to the Southern Ocean secure for it a cool climate and a good rainfall. Settlement is rapidly extending, while townships along the coast promise to become popular watering places and natural sanatoria of the State.

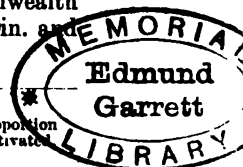
Of the total area of the State, exclusive of the Northern Territory, less than one-fourth is within the 46 counties which have been proclaimed. **Land in Occupation.** These counties represent the more closely settled portions of the State, and the proportion of "occupied" land is greater, amounting to two-thirds. Beyond the limits of agricultural settlement 119,380 square miles, or 76,402,950 acres, are held by 500 Crown lessees as sheep or cattle runs. The conditions under which land may be acquired in South Australia are set out in another chapter, and it is sufficient to remark here that the freehold has been parted with to the greatest extent within the assured rainfall area, while

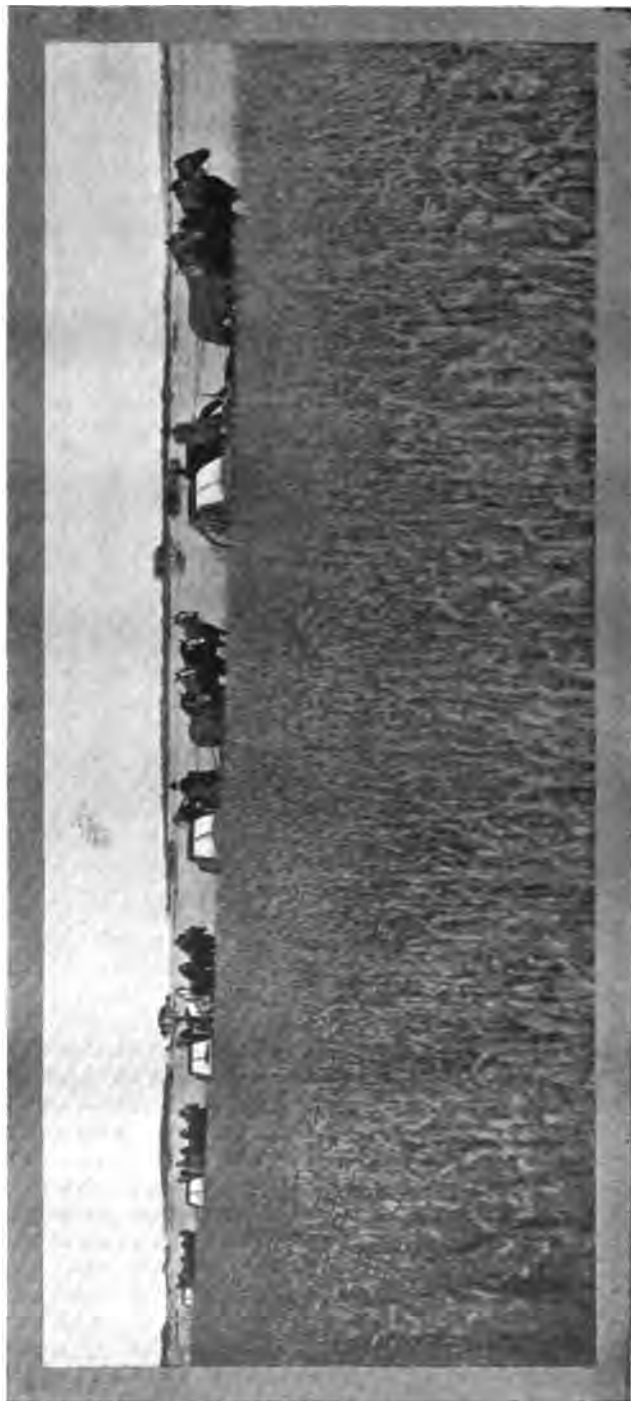
outside the limits of counties the alienated land is infinitesimal. In proportion to population South Australia has the largest area under cultivation of any of the Australian States, the ratio per head being about nine acres. At the same time the cultivated area in proportion to the wide expanse of the State is but fractional. The reason for this is that the rainfall in some parts is not sufficient to make agriculture more than a hazardous calling, and much of South Australia's landed estate will on this account have to be put to other use. Still, that this State makes good use of its opportunities in comparison with other parts of the Commonwealth will be seen from the following figures, which deal with country where the rainfall is 10in. and over per annum :—

	10in. and over.	Area Cultivated.	Proportion Cultivated
		Acres.	Per cent.
South Australia	40,360,000	2,275,506	5.64
Northern Territory	223,000,000	small	—
New South Wales	182,200,000	2,674,896	1.47
Victoria	56,240,000	3,321,785	5.91
Queensland	339,000,000	539,216	0.14
Western Australia	234,200,000	327,391	0.14
Tasmania	16,000,000	226,228	1.41
Commonwealth	1,151,000,000	9,365,022	0.81

Cultivation and Rainfall.

Years ago the late Mr. Goyder, then Surveyor-General of South Australia, traced on the map what has ever since been known as "Goyder's rainfall line." This was nothing else than the demarcation of country inside of which the natural "saltbush" and other herbages so characteristic of Australian back country do not grow. The "line" takes a southern semi-circular sweep to the coastline of Eyre Peninsula, and strikes the opposite side of Spencer's Gulf about Moonta. Then it makes a long northerly curve to just south of Booleroo Centre, terminating in a second peak at Orroroo. Thence the direction is south-east, crossing the River Murray about Swan Reach. This observant official did a great service to all succeeding settlers by roughly, and yet with wonderful accuracy, indicating the country inside of which the rainfall is regular, but outside of which agricultural pursuits must, in the nature of things, be hazardous. Twenty years ago, for instance, when the far northern areas were thrown open for farming occupation one or two wonderful seasons were experienced and "bumper" crops were taken off the virgin soil. This "outside" country is being more successfully devoted to mixed farming. The land will produce anything with a fair rainfall; the soil is easily worked, and by means of farming and dairying many men are making a living where formerly ruin stared settlers in the face. The pertinacity and courage with which in dry years this country has been tilled, and methods adopted to meet changing circumstances are a tribute to the stamp of farmers who have made South Australia what it is from an agricultural standpoint. The Surveyor-General of the State, after an extended tour round the world, states in a report to the Government that in his opinion the system of soil-culture known as "Dry Farming" would help towards the successful occupation of what is known as outside country. He wrote — "In South Australia entirely outside the limits of a reliable rainfall, where wheat is now successfully grown, there is an area of approximately 24,000,000 acres, having an average rainfall of from 10in. to 15in. Of this area about 2,000,000 acres are occupied, and partially but not satisfactorily cultivated, which leaves a balance of 22,000,000 acres, comprising a large area of rough ranges, stony hills, and land useless for cultivation purposes. After deducting all that, it is estimated that from 3,000,000 to 4,000,000 acres, as far as the soil is concerned, is available for dry farming. Should it be found on trial that farming can be profitably carried on with a rainfall of 10in. to 12in., what an immense benefit the extension of this system would be to the State! A more careful system of farming on these methods, even in the districts with a fair rainfall, would, I feel certain, result in an average increase in our yields of several bushels per acre."





Govt. Photo.]

The above shows five complete harvesters at work in a large field of wheat at Mount Templeton. The crop is left until the grain is quite ripe, and these machines strip, thresh, winnow, and bag the grain at one operation. From 13 acres to 16 acres per day is harvested by each machine.

It cannot be otherwise than interesting to the intending settler to see how the land within the area of regular rainfall is utilised. The official calculation of the area of land within the rainfall area is 27,776,000 acres, but in the following table the information is given in a different form and somewhat more exactly :—

Division.	Area.	Cultivated.	
		Total.	Wheat and Hay.
	Acres.	Acres.	Acres.
Central	6,132,533	1,187,810	888,445
Lower North	2,514,520	743,809	725,379
Upper North	576,000	189,443	186,227
South-Eastern	8,297,600	144,839	84,876
Western	11,700,840	218,848	213,748
Total within rainfall area	29,221,493	2,484,749	2,098,675

"Closer Settlement. Closer settlement is the last word in agricultural policy, and by this and other means the "cultivated area"—the true test of agricultural progress—is steadily expanding; and as large estates in favored localities are being purchased by the Government or private persons and cut up into small holdings suitable for farmers, the area under cultivation will continue to increase. There is room for considerable development, more particularly in the south-eastern portions of this State, regarded by competent authorities as "the New Zealand of Australia." "One of the lessons taught by the late drought," says the Government Statist, "has been to impress upon farmers that, even in dry seasons, careful husbandry and the adoption of modern systems will ensure returns for their labor otherwise unobtainable. Utilising sheep in the stubbles and on the fallows, thereby clearing the land of wild oats and noxious weeds, is very general, as also is early sowing with the aid of the drill, depositing such chemical manures as are required by the soil to produce good and clean crops of superior grain. Ground so husbanded has yielded more than double the return in frequent instances, both of wheat and hay, and conduces to the fuller development of the staple products of the country, and consequently to the additional value of real estate. Not many years ago the use of artificial manures was, except to a few, unknown on farms; at present about 1,000,000 acres, or one-half of the entire crop, is so treated."

An initial error made by the pioneer agriculturist was an attempt to transplant English methods of farming. Original blocks of 80 acres were surveyed, but it was not long before these "garden plots" were found to be quite inadequate to support a family with wheat as the only product. Then the pendulum swung the other way, and in some instances farms held by one person became too large in the best interests of the country, and often for the good of the owner. The ambition of the tiller of the soil was to be able to point to large fields of waving corn—to carry on his operations on an extensive scale. Quality was often sacrificed for quantity in the desire to cultivate a maximum area in a minimum period. Thus it came about that prosperity in agricultural centres was wont to be measured by the acreage sown. All this, however, belongs to the past, and methods of farming are not now the subject of reproach that they were 20 years ago. The acreage cultivated means far more in South Australia to-day than an equal area did 15, or even 10, years ago. In other words, the productive capacity of the farming country has been steadily increased, until our people are able to better understand what "intense culture" means. Said Professor Lowrie (till recently head of the State Agricultural College)—"If we get a return to one of our normal years the wheat acreage of South Australia, with the attention farmers are giving to manuring, will be raised to a degree that even the most sanguine scarcely expects. In a relatively few years we will find the wheat average in this country somewhere about 11bush. or 12bush. to the acre, and it will involve very little more work than at present."

Buying Estates for Farmers.

Under an Act of Parliament passed in 1903 the Government is authorised to repurchase estates for closer settlement purposes, and up till the end of June, 1907, the provisions of the Act had been availed of to the extent of obtaining possession of 345,890 acres, nearly the whole of which is in well-watered country. In place of a comparatively few persons on the land prior to the repurchase of the estates, there was on June 30th, 1907, a population of 3,646 adults and children. The cost to the Government of acquiring these estates was close on £900,000, but the purchasers and lessees have on the whole fulfilled the covenants of their agreements and leases remarkably well, and arrears of rent and instalments of purchase-money represent only a fraction of the total indebtedness. New provinces have virtually been added to South Australia by the opening up of land in the Western Division, where a railway from the back country to the coast is nearing completion; and the construction of a line of railway from near Murray Bridge, on the overland route to Melbourne, to Pinnaroo. Ever since the return of good seasons some years ago there has been a veritable land hunger. Prices of broad acres have advanced rapidly; but so great has been the demand that many applicants for blocks have not been satisfied. Government surveys parties have been kept busy. In 1904 they dealt with 460,694 acres; in 1905, 570,907 acres; in 1906, 518,607 acres; while the total for 1907 was still larger.



Farmers Visiting the State Agricultural Farm, Roseworthy Agricultural College.

Reclamation of Swamp Lands.

South Australia is not an arid country. Its public estate includes wide expanses of swamp lands—land contiguous to the River Murray, but subject to inundation, and land in the South-East, with a bountiful rainfall, but badly drained. A vigorous policy of drainage and reclamation is converting such sour and otherwise unprofitable land into smiling farms.

The land authorities are persisting in the effort to successfully utilise valuable swamp country. A large area is situated on either side of the River Murray for nearly its whole length—a distance of about 350 miles—and it is capable, with moderate expenditure, of keeping many thousands of people. The Surveyor-General is of opinion that the area of low-lying land along the river valley between Wellington and the State boundary is, excluding freehold property, approximately 170,000 acres; and, with an average outlay of about £6 an acre, that land would be worth, at the lowest calculation, £20 an acre, or £3,400,000. About 10 acres would keep a family (say of four persons), and the whole area should support a population of about 68,000. As the bulk of this land is Crown property, and the balance held on lease could easily be acquired, it is one of our most valuable assets. Up to the present close on 600 acres have been reclaimed, and nearly the whole of the area has been allotted.

Drainage applied to the swamp lands adjacent to the River Murray has produced marvellous results. Irrigation promises to become a significant factor in the agricultural industry of South Australia. In addition to the irrigation colony at Renmark, which will be dealt with separately, settlements are steadily multiplying in the valley of the Murray. What within the memory of young men was a wilderness—barren, inhospitable land, or swamps covered with useless rushes—is being made productive. The transformation scene has been worked so quietly and quickly that few people realise what the change really signifies. It is materially affecting the producing strength of South Australia.

A few years ago Millicent—a typical centre of the drainage area in the South-East—was little better than a swamp, with here and there a hillock modestly raising its head out of the water, generously offering itself as a perch for the wildfowl to rest upon. The land, when not so covered, was sour and irresponsive to the persuasive devices of the cultivator. The town was small, and nothing ever happened to disturb the peaceful meditations of a somnolent



Crop of Sorghum on Land Reclaimed from River Murray.

people. To-day Millicent hums. There is a whirr and buzz everywhere you go. Out on the lowlands, where rank grass used to grow, you can get up to your knees in a lucerne patch or a rape crop. Where a mower and binder has been at work for a week an army could be hidden out of sight behind great stacks of hay, which stand close together, and are eloquent of the large yield which the paddock has produced. There are root crops as well as grain crops grown on the farms, lambs are being bred for the export trade, and more attention is now devoted to dairying. The more one sees what has been done the more impressed one becomes with the possibilities of this country. It is no reflection on the settlers to say that they have yet to realise the full extent of the natural resources of the district. Some of them have only begun to discover the capabilities of their land; a few will not live long enough to do that, but those who take their places will find it out. Few problems have so exercised the minds of past and present legislators than the question of draining the lands of the South-East, and yet it seems one of the surest and most profitable investments in which public money can possibly be employed.

The area of unoccupied land in South Australia at the end of How Land is Held. 1906 represented 57·28 per cent. of the total landed estate, and in the Northern Territory 67·12 per cent. These figures are higher than the percentage for the whole of the Commonwealth; but, as previously explained, large tracts of country are not suitable for occupation in the sense in which the term is popularly employed. The State is still the largest landowner, only 3·68 per cent. of the area of South Australia proper having been alienated, while 30·04 per cent. is under lease. The percentage for the Commonwealth in the former instance is 6·44 per cent., and in the latter 29·21 per cent. A comprehensive statement of the disposition of the public estate is officially supplied in the following:—

STATEMENT OF LANDS SOLD, GRANTED, LEASED, AND AVAILABLE. ON MARCH 31ST, 1907.

On March 31st, 1907.

	Number of Agreements or Leases	Area in Acres.	Purchase-money.		
			£	s.	d.
Alienations held in fee simple (exclusive of 311,998 acres 3 roads 29 perches repurchased, together with 14,529 acres 22 perches of leasehold) for homestead and closer settle- ment at £841,872 9s. 1d.	—	7,780,021	10,044,334	18	3
University lands	—	49,970	—	—	—
Agricultural College lands	—	50,000	—	—	—
Schools, institutes, &c.	—	8,511	—	—	—
Renmark irrigation scheme	—	13,348	—	—	—
Dedicated for commonage, Renmark settlement	—	16,652	—	—	—
Dedicated under control of Conservator of Forests	—	167,973	—	—	—
Held under credit agreements	24	10,193	8,794	6	2
Held under agreements to purchase	1,110	818,196	343,576	4	6
Held under agreements to purchase repurchased lands	691	168,829	458,138	14	1
			Annual Rental.		
Right of purchase leases	7,144	4,676,282	25,746	8	6
Scrub leases, with right of purchase, 21 years	154	62,433	—	—	—
Special leases, with right of purchase, 21 years	1	989	25	19	3
Homestead leases, with right of purchase, 21 years	1,526	25,747	1,500	6	9
Homestead leases, with right of purchase, 21 years	142	1,903	442	18	6
—Repurchased lands	541	8,674	625	5	4
Homestead leases, perpetual	130	808	435	12	5
Homestead leases, perpetual, repurchased lands	80	1,686	212	18	7
Homestead leases, perpetual, closer settlement lands	7,282	11,528,185	50,848	4	3
Perpetual leases	241	77,640	6,803	9	8
Perpetual leases of closer settlement lands	148	55,104	1,175	16	9
Perpetual leases of forest lands	91	17,420	144	5	0
Perpetual leases of village settlement lands	1,725	1,435,101	7,104	1	9
Miscellaneous leases	193	74,704	767	14	6
Selectors' leases	—	—	—	—	—
Grazing and cultivation leases	27	79,481	207	15	8
Reserved lands (South-East) leases	15	28,086	214	16	7
Aboriginal leases	24	505,476	11	5	0
Pastoral leases	516	77,171,910	23,848	4	11
Totals of land sold, &c.	21,805	104,835,322	119,915	4	3
Surveyed roads, railways, and other reserves	—	1,400,500	—	—	—
Open to allotment by the Land Board—					
Homestead lands	—	2,207	—	—	—
Pinnaroo lands	—	121,200	—	—	—
Other Crown lands	—	2,192,648	—	—	—
Open under miscellaneous leases (for allotment or selection)	—	240,058	—	—	—
Open to allotment by Pastoral Board	—	16,328,320	—	—	—
Before Land Board for recommendation	—	145,874	—	—	—
Fresh water lakes	—	224,000	—	—	—
Salt lakes and lagoons	—	7,680,000	—	—	—
Unleased vacant lands exclusive of above	—	110,074,671	—	—	—
Total area of South Australia (exclusive of the Northern Territory)	—	243,244,800	—	—	—



CARTING GRAIN TO MARKET.



WINNOWING—CLEANING WHEAT FOR BAGGING.

Room for Expansion. South Australia possesses a stretch of country at least 500 miles long by an average of 60 miles broad, wherein agricultural pursuits of every description can be followed. Beyond this limit the country is more suitable for mixed farming and pastoral pursuits. There is room for expansion—plenty of room for the making of homes and the building up of fortunes in a country where the climate is perfect.

Farming Lands. The agricultural lands hug the coastline, and the farthest grain-producing district inland is well within 150 miles of a shipping port. The average distance of grain transport by rail is about 50 miles, an important factor in reducing the transportation charges to a minimum. In the Central Division, which lies between the seacoast and the River Murray, the facilities for transit are excellent. The bulk of the arable land is situated within 15 miles of a railway station or a shipping port. It is within the Central Division that production has become most diversified.



Fine Crop of Lucerne on Reclaimed Swamp Land near Murray Bridge.

All this means cheapness of transit to the seaboard, thus materially reducing the cost of the grain by the time it is afloat. There are few countries in the world better situated in the matter of climate, soil, and machinery for the cheap production of grain; and proximity of the cultivated territory to the seaboard is a great factor when prices are governed—as they are always when there is a surplus available for export—from Mark Lane. Further reference to the cost of production is made in the section devoted to cereal production.

Diversified Farming. Wheat is the principal crop cultivated, but production is becoming more diversified every year. The farmer does not carry his eggs in one basket to anything like the extent he once did, and “minor” industries are assuming an importance which will, at the present rate of progress, no longer justify the use of that term. Most farmers now run a flock of sheep on their holdings, while the opening up of new outlets oversea for perishable produce which comparatively recently

threatened to glut the local market has been responsible for the virtual creation of a new class of rural producers. In the following table is shown the area of land devoted to cultivation in South Australia at selected periods :—

						1884-5.	1896-7.	1906-7.	Percentage. Increase or Decrease.	
									1897 on 1885.	1907 on 1897.
									Per cent.	Per cent.
						Acres.	Acres.	Acres.		
Wheat	..	..	..	..	..	1,942,453	1,693,045	1,681,982	- 12	- '65
Hay ..	..	..	..	..	..	308,429	339,257	295,895	+ 9	- 12
Oats ..	..	..	..	..	..	7,204	40,215	57,000	453	+ 41
Barley	..	..	..	..	..	15,697	14,484	28,122	- 7	+ 93
Fallow	..	..	..	..	..	450,536	512,561	1,065,921	+ 13	+107
Total cereals ..						2,724,379	2,590,562	3,128,920	- 4	+ 20
Vines ..	..	..	..	..	..	4,590	18,333	22,575	+299	+ 23
Green storage ..	..	..	..	..	..	33,296	27,398	41,664	+ 17	+ 52
Garden	..	..	..	..	..	4,942	6,669	8,379	+ 34	+ 25
Orchard	..	..	..	..	..	5,825	11,746	18,199	+101	+ 54
Potatoes	..	..	..	..	..	5,666	6,417	9,894	+ 13	+ 54
Peas ..	..	..	..	..	..	4,601	3,519	7,109	- 30	+102
Totals ..						2,785,490	2,584,395	3,239,891	- 7	+ 25

In connection with this table it should be explained that official statistics of production were not collected in 1886, so that an earlier period has had to be selected as the starting point. Ten years ago the State was afflicted with a drought of unusual severity, but a complete recovery has since been made and many valuable lessons have been taken to heart by the "man on the land," not the least important of which is that more attention must be paid to diversified production. The differences in the acreages have been expressed in percentages, so that there may be some common basis of comparison.

Value of Primary Products.

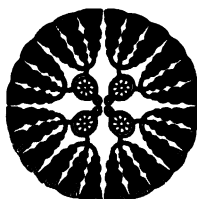
Value of Primary Products. At the 1901 census the number of persons engaged in primary production was 49,161, or 13 per cent. of the total population. By far the greater number were engaged in agriculture—34,186; dairying and poultry-farming claiming 2,868; and pastoral pursuits 4,193. The average number of acres cultivated per person engaged was 69.3—the highest for any of the Australian States. This State also leads in the average value of agricultural produce per head of population. Allowing the same proportion of people to be engaged in primary production at present as six years ago, the total would appear to be 49,996, and those following agriculture 34,612. The result of the labor of these 50,000 people last season and on the basis of prices then ruling is a wonderful tribute to the growth of the agricultural industry in South Australia.

Wealth from the Soil.

Wealth from the Soil. The increase in the acreage devoted to the various crops does not, however, completely explain the advance which has taken place of recent years in rural industries. The application of scientific methods to farming, the rotation of crops, water conservation, selection of localities best suited to particular products, and other up-to-date methods are responsible for an acre of land being more productive than hitherto. If one proof of this were required it would be found in the greatly increased price of land. While the prices of commodities have had an upward tendency of recent years rural industries would not have returned such a profit if at the same time the productiveness of the soil had not been increased. It will, therefore, be interesting to see exactly what the State is producing, and for this purpose the crops of last season are compared with the average of two quinquennial periods, the influence of exceptional seasons being by this

means minimised. Unfortunately in the earliest period statistics were not collected on as broad a basis as they are at present, but in any case the following table is one of which any people might be proud :—

	1880-1885. Five Years' Average.	1900-1905. Five Years' Average.	1906-7.
Wheat (bush.)	10,664,128	10,170,691	17,145,796
Hay (tons)	286,027	356,585	395,766
Barley (bush.)	164,705	321,251	491,246
Oats (bush.)	57,933	582,987	896,166
Peas (bush.)	55,380	74,009	140,367
Potatoes (tons)	19,841	21,774	22,277
Almond trees	123,320	152,405	199,413
Almonds (cwts.)	2,149	5,728	7,010
Orange trees	—	109,490	161,200
Oranges (cases)	—	72,572	114,150
Apple trees	—	—	755,930
Apples (cases)	—	—	311,538
Lemon trees	—	61,330	65,955
Lemons (cases)	—	29,937	37,378
Olive trees	44,956	61,740	83,153
Olive oil (galls.)	1,175	11,622	16,161
Hives of bees	—	28,700	24,107
Honey (lbs.)	—	857,702	1,088,489
Vines bearing	3,216,122	9,207,935	10,599,712
“ not bearing	369,451	1,215,908	1,523,999
Wine made (galls.)	398,699	2,096,599	2,441,504
Currants dried (cwts.)	—	6,405	23,281
Raisins made (cwts.)	588	9,758	16,123
Butter (lbs.)	—	5,566,660	8,873,632
Cheese (lbs.)	—	922,838	1,398,785
Wattle bark (tons)	—	8,324	7,274





CULTIVATORS AT WORK.

Modern "Aids" have Helped the Farmer to Greatly Reduce Cost of Production.

[J. Marshall, Photo.]

CHAPTER XI.

AIDS TO AGRICULTURE.

BEFORE passing on to a review of the various industries which come naturally under the head of agriculture, it will be interesting to briefly refer to a few potent "aids" to farming. There is the influence which artificial manures have had in restoring fertility to over-worked soil, while no reference to the agricultural industry would be complete which omitted to direct special attention to the remarkable evolution in farm machinery. South Australia has led the way in both. The stripper was invented in this State, and has been perfected here. Similarly, the stump-jumping plough, which has been the means of revolutionising farming in the scrub lands of Australia. Just at a time when it seemed as if the agricultural industry had got into a blind alley—as if the limit of production had been reached—science came upon the scene and provided a key capable of fitting every lock. Unknown portals flew open and showed a clear passage where apparently insurmountable obstacles had previously blocked all progress. To Mr. A. Molineux—at that time agricultural editor of the *Adelaide Observer*—great credit is due. He was the first man to preach the gospel of hope to rural producers. He did more than preach; he demonstrated and



Eleven-furrow Stump-jump Plough, Covering about 8ft. in Width.

[Ziegler, Photo.]

proved. It was Mr. Molineux who founded the Agricultural Bureau system, promoting experiments which led to the introduction of so many improvements in the growing of cereals, and in fruit culture. One success led on to another, so that, from having been a class of sceptics, rural producers took a pride in adopting new methods. Science continues to be a mighty lever in agricultural fields, and it is only those who are ignorant of the forces at work who doubt the future of the rural producer in these lands. No Australian State has a better agricultural record, while in South Australia the cost of production is lower than elsewhere.

Artificial Manures.

Fertilisers have had an important influence on the fortunes of producers. They have helped more than anything else to bring about a revival in agricultural pursuits. Constant cropping had exhausted the soil. The farmer in many parts sowed but reaped not, and the average production of the State began to suffer. Fallowing was resorted to in order to check the drift. There was a recovery, but not sufficient to compensate for the rapid decline which took place about

the same time in the price of wheat. The position became critical, but the dawn followed the darkest hour in the agricultural history of the State. In 1879 an Experimental Farm and Agricultural College were established at Roseworthy, distant some 30 miles north of the city. Professor Custance was the first Principal, and in his first report he stated—"Perhaps the most important result is the beneficial effect of bonedust and guano, 5cwts. of each, which produced 26bush. per acre. Should this result be confirmed next season it would indicate the value of phosphates and nitrogen in increasing the wheat crop. Probably mineral phosphates and nitrate of soda may be found in the colony. If so, by means of the application of about 1½cwts. of nitrate of soda and 5cwts. of phosphates per acre on well-cultivated lands, the yield of wheat may be increased considerably, in many districts as much as 50 per cent." In his next report, 1883, Professor Custance wrote—"Wheat may be grown year after year on the same land under certain conditions with profit to the farmer, one of the conditions being a cheap



A Motor-power Winnower—3½-brake Horse-power Engine. This winnower will clean over 1,000 bushels of wheat per day.

[Gordon Bails, Photo.]

supply of suitable manure—that is, manure containing the ingredient deficient in the soil and required by the wheat plant, which proves to be phosphoric acid." In 1885 the same authority wrote—"Some important facts will be noticed, notwithstanding the unfavorable season, such as the yield of 22bush. per acre from 3cwts. of superphosphates . . . The quantity of superphosphates used, viz., 3cwts., costing, at 4s. per hundredweight, 12s. per acre, should induce farmers to give this manure a fair trial. After numerous experiments carefully conducted during the last four years, I can strongly recommend superphosphates as the cheapest and best manure for the wheat crop." Professor Lowrie, who succeeded Professor Custance at the Agricultural College, enthusiastically worked along the same line, and did yeoman service for the State. In 1894 he put the following opinion on record:—"The phosphatic manures are found specially suitable under our South Australian conditions. The practice of bare fallowing and the absence of under-drainage and summer leaching of the nitrates in the soil

are the means of maintaining a relatively high proportion of nitrogen in the soil, and experience is leading us more and more to the use of phosphatic manures in relatively high proportion compared with nitrogenous manure. Speaking generally, it is more from deficiency of phosphates than any other element of plant food that our average wheat yield in the colony is so unfortunately and discredibly low." In a paper read before the Agricultural Bureau Congress in 1896, Professor Lowrie observed—"The phosphatic manures are the most beneficial in the first instance at least. In all districts where the rainfall exceeds 15in. or 16in., I believe it will be found, if the cost of carriage of the manure be not prohibitive, that manures can be profitably used for wheat; and in all hay-growing districts I have not the slightest hesitation in saying that no practice open to us is more profitable, as far as agriculture proper extends, than the regular judicious use of artificial manures. For grain probably 1½cwt. to 2cwts. will be found a good useful dressing for an acre." Subsequently Professor Lowrie—in the light of further experiments conducted by himself—declared:—"We only want a good season to thoroughly establish the confidence our farmers now feel in the use of artificial manures. I am sure that with a fair season the wheat average will be nearly double what it would have been had the practice of farmers been what it was eight or ten years ago."

Whilst this educational process was at work at the Agricultural College, enterprising farmers were supplying practical demonstrations. Farmers on Yorke's Peninsula led the way, and in no part of the State have fertilisers worked so wonderful a change. A few years ago land on Yorke's Peninsula, which is now firmly held at £5 to £8 per acre, could not be sold at 25s. per acre. Artificial manure, and that alone, was responsible for the change in land values, and a corresponding movement has taken place in other parts of the State. In 1894 11 acres were drilled in with wheat and superphosphate to the extent of 90lbs. per acre. The result was satisfactory, and next year the area was extended to 200 acres. It is estimated that about 1,456,000 acres are annually treated with artificial manures.

The following table shows the acreage under cultivation, the quantity of artificial manures used, and the acreage treated in the years stated:—

	Acreage Under Cultivation.	Tons Used.	Acres Manured.
1898	2,148,000	12,500	250,000
1900	2,298,000	24,800	500,000
1902	2,144,000	37,500	845,000
1904	2,164,000	52,000	1,170,000
1906	2,063,000	59,000	1,321,000
1908	2,164,000	68,000	1,456,000

The percentage of "manured land" increased from 11·6 per cent. in 1898 to 54·4 per cent. in 1904, and 67·6 per cent. in 1908.

A tempting bonus was offered by the Government to the discoverer of a payable phosphate mine, and this amount has been paid to a prospector on Northern Yorke's Peninsula. Several other phosphate claims are being worked with excellent results. The introduction of fertilisers led to a largely increased demand for seed drills.

From the Primitive Sickle to the Modern Harvester.

The machinist has ever been a good friend to the agriculturist. Early in the forties there was an agricultural crisis, and so serious did the position become that an official decree went forth prohibiting the exportation of wheat! From 4,000 acres under grain in 1841, the area under cultivation rose to 14,000 in the

next year. The problem of harvesting the crop by means of the ancient sickle, and in the absence of a supply of laborers was apparently insolvable. Imperial soldiers then doing duty in South Australia were ordered—if not to actually turn swords into ploughshares and spears

into pruning hooks—to go out into the fields and assist to gather in the harvest. Harvesting charges ranged up to £2 per acre. It was doubtful whether, in view of their experiences, land-owners would sow wheat the following year.

The necessity of some contrivance to aid producers in harvesting having been made so apparent, a body called the "Corn Exchange Committee" took the matter up with zeal, and announced, through the columns of *The Register*, that they would be prepared to give a reward for the best invention to be exhibited to the committee. Thirteen persons presented models and drawings of various machines, but the committee came to the conclusion that there was none which they were justified in recommending for general adoption. In the meantime, Mr. John Ridley, a miller, of Hindmarsh, who did not compete, built a working machine, on the principle of stripping the heads off the straw. He acknowledged his indebtedness for the idea to an article in an encyclopædia, in which was the cut of a machine used in ancient days on the plains of Gaul. This was at once a complete success. The machine was propelled by a pole from behind, the pole being supported on two wheels. Two horses did the work. Mr. Ridley presented the invention to the public, and got no profit out of it except a margin on the actual implements which he made and sold. Describing the first public trial of this stripper, the late Mr. Francis Dutton said—"One afternoon during the summer of 1843-4, some friends met in Adelaide and asked me to join them in their ride to a neighboring farm where Mr. Ridley's



The Original Ridley Reaper.

reaping machine, which they said both reaped and threshed the corn at the same time, was successfully at work. It was not generally known at that time what the machine was, and, although we were all incredulous, we started to see with our own eyes how far the reports we had heard were correct. Presently we saw from several quarters other horsemen all steering to the same point. By the time we reached the farm a large 'field' had mustered to witness the proceedings, and there, sure enough, was the machine at work, by the agency of two horses and two men—one to guide the horses and the other the machine! There was no mistake about it—the heads of the corn were threshed perfectly clean; and, a winnowing machine being at hand, the corn was transferred out of the reaping into the latter machine, and carts were ready to convey the cleaned wheat to the mill, two miles off, where the wheat, which an hour before was waving in the fields in all the lustre of golden tints, was by Mr. Ridley's steam-mill ground into flour. Never before was, perhaps, such a revolution in the appliances of agriculture caused as was done by this machine; success attended the very first trial of it, and during seven days it reaped and threshed the 70 acres of wheat of which the paddock was composed." In *The Register* of January 30th, 1844, it is stated that the following resolution had been passed at a meeting of the South Australian Association the previous evening:—"That in the opinion of the Society the machine for reaping and threshing wheat in the field, invented by Mr. Ridley, is calculated to assist agriculturists and benefit the province in enabling the grain to be brought to the place of shipment at a price which will afford encouragement

for a speedy extension of grain culture for exportation, and that Mr. Ridley is entitled to the thanks of this Society for his invention." There is no room for doubting that the stripper, or reaping machine, from which the complete harvester was evolved, is a South Australian and not an American invention.

New hope was given to settlers, and agriculture progressed by leaps and bounds, the "area under wheat" being nearly doubled in one year. The late Captain Bagot wrote a letter to *The Register* giving his experience of the machine in the following harvest, 1844. He said that he reaped a field of 39½ acres of wheat in nine days, and obtained 843bush. of good clean grain. He figured out the cost thus:—

	£	s.	d.
Two men with the machine, one to steer and the other to drive, nine days, at 2s. 6d. each	2	5	0
Use of the machine, at 2s. 6d. per acre	5	0	0
Cost of stripping 843bush.	£7	5	0
Or a little more than 2d. per bushel.			

Three men were employed for 12 days winnowing and carting in the corn to the store.

	£	s.	d.
Three men, 12 days each, at 2s. 6d.	4	10	0
Use of winnowing machine	1	0	0
Cost of winnowing	£5	10	0
Or less than 1½d. per bushel.			

Thus the Ridley stripper at once reduced the cost of harvesting from 2s. per bushel to 3½d., or for a 20bush. crop from £2 per acre to 5s. 10d.! No wonder Captain Bagot spoke of the "extraordinary value of Mr. Ridley's admirable invention"!

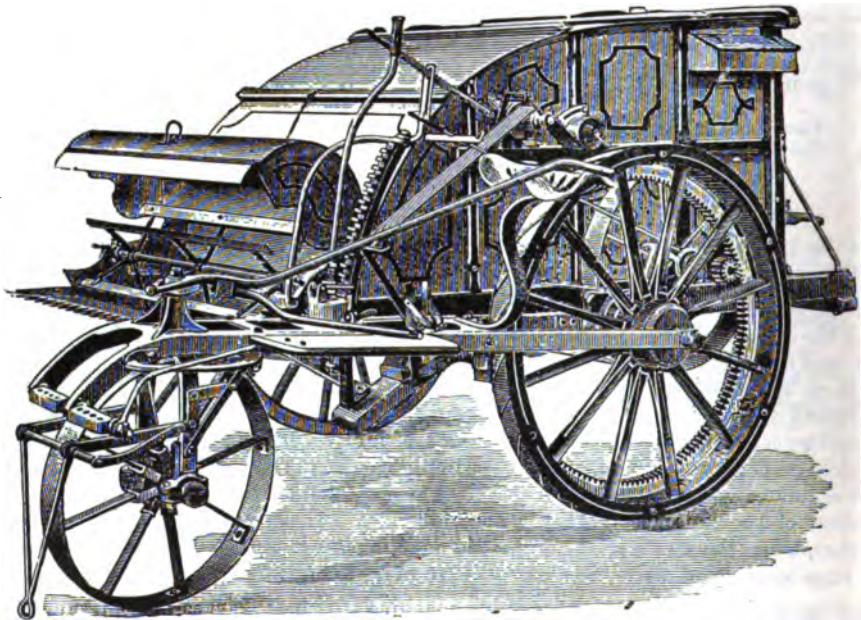
From the Ridley machine sprang the splendid strippers which are now to be seen all over Australia and the "complete harvester" at present commanding attention. In the fifties the late Hon. James Martin obtained £150 for the first reaper he made. To-day the greatly improved modern machine can be bought for a third of that price. The principle of propulsion from behind soon gave way to a side application of motive power. Then followed the thimble comb, which prevented a loss of grain. A simplification of the machine enabled one man to steer and regulate, whilst a reduction in the draught lessened the number of horses required. The addition of the "damp weather gear" followed. This enables stripping to be done in cold weather, when the straw is not so brittle as it is on a hot day. South Australian makers export a large number of strippers every year to neighboring States and Argentina.

From the perfected stripper, or reaping machine, to the "harvester"—a combination of stripper and winnower—appears a simple evolution. The adaptation cost the machinist a great deal in time and money. The advantages of being able to strip, clean, and bag a crop in one operation have long been recognised, but accompanying disadvantages and difficulties prevented such a machine coming into extensive use until recently. South Australia took the lead in endeavoring to produce such a machine, for late in the seventies the Government offered a bonus of £4,000 to the successful inventor of a machine that would reap, thresh, clean, and bag in one operation. As the outcome of this offer three trials were held in December, 1879, at the farm of Mr. John Riggs, near Gawler. On the 17th there were 14 machines entered and on the 23rd 10 competed. The result of these tests was that the judges—Messrs. E. W. Pitt, Robert Smith, James Clark, William Fergusson, and John Riggs—selected four machines to be tried again on the 24th. The judges, in their report to the Commissioner of Crown Lands, were of the opinion that no machine as exhibited to them did its work in such a manner as to entitle the owner to the £4,000 offered. Of the machines exhibited those which possessed the most merit stood in this order:—George Marshall, of Alma; J. H. Adamson, of Auburn; George Phillipson, jun., of Wangaratta, Victoria; James Martin & Co. of Gawler. To these exhibitors the judges recommended that the following awards should be made:—Marshall, £100; Adamson, £70; Phillipson, £50; Martin & Co., £30. The adjudicators also recommended that, considering the amount of money spent by some of the competitors and the importance

of labor-saving machinery, trials should be arranged for the following harvest. Among the machines which the liberal bonus attracted was a monster implement from America, which required 14 horses to draw it.

South Australian machinists were not to be denied, however, more particularly when Victorian competitors came into the field. After repeated attempts and some failures, "complete harvesters," fulfilling all requirements, have been made available, and a large number of them are in use in South Australia, Victoria, and New South Wales.

An important auxiliary to the stripper is the winnower. This machine has occupied an important place among the implements on the farm. The climate of South Australia is particularly favorable to the gathering of grain crops. The weather at harvest time is dry. There is little or no humidity. When the wheat is reaped by the stripper—that is, the heads taken off and threshed—the grain mixed with chaff is placed in heaps. As soon as convenient the winnower is brought into requisition, and it separates the wheat from the chaff.



A Modern Stripper.—Evolved from the Ridley Reaper.

Haymaking has also been simplified in the great fields of Australia. English methods were quite inadequate to cope with the work to be accomplished. First there was the scythe and hand-rakes. Then came the old-fashioned mowing-machine and horserake. These have been completely superseded by the binder, which does all the work in the one operation. Not the least important "aid to agriculture" in South Australia is the stump-jumping plough. The early settlers used wooden implements similar to those which did service in ancient Egypt. Wooden ploughs and harrows were manufactured in South Australia, but they soon became relics, and as such they still command a small value. The two-furrow was quickly followed by the three, four, and five, but the most significant development took place when the mallee scrub lands were occupied. For a time settlers cut down the trees and dug out the roots, but this process proved costly and tedious. Scrub farming in the mallee lands of Australia would astonish an English farmer. Mallee scrub consists of light timber varying in size from whip-sticks up to timber a few inches in diameter. At first the practice was to cut down the trees and grub up the roots, but soon South Australia led the way in a new system which revolutionised agriculture in the mallee lands of the Continent. A man named Mullens cut down the

trees on his scrub sections level with the ground, and, taking a V-shaped log, he drove long spikes through it. He hitched the horses on to the pointed end of the V-log and dragged the home-made implement over the stump-covered field. The wheat thus scratched in did well, and the crop yielded a good return. There was no difficulty in working a reaping machine over the stumps and stripping the grain. This system of farming in the scrub country was termed "Mullenising." Its simplicity, cheapness, and effectiveness soon caused it to become popular. The next evolution was the rolling down of the light mallee by means of heavy rollers—old boilers from a mill furnace proved the most serviceable, and they were eagerly sought



Clearing Light Scrub Prior to Cultivation.

[Dabovich, Photo.]

The heavy timber frame shown above is shod with steel plate. This cuts or drags up all before it. When the brush is dry it is burnt, and the land is then ready for ploughing. Horses or bullocks are also used for this work. These implements are made to clear from 12ft. to 30ft., according to the power employed.

after. The owner of a good roller had no difficulty in obtaining contracts for the levelling of the mallee. The roller was pushed in front of bullocks or horses, and the scrub was flattened down. When the timber was dry enough a fire was started, and in the early days of this system this practice led to a number of disastrous bush fires. Traction engines drawing huge rollers are now used for breaking down mallee scrub. The V-shaped log soon gave place to improved implements of the stump-jumping class, and so perfect have these become that fields full of mallee roots below the surface can be cultivated as successfully as meadow lands. The problem which presented itself when the timber had been cleared off was how to cultivate the land with the roots still in the ground. The brothers Smith, on Yorke's Peninsula—Messrs. R. B. and C. H.—solved the difficulty by inventing and perfecting a stump-jumping plough.

There is more than one claimant for the honor of having introduced this exceedingly useful invention. It is contended, on behalf of Mr. R. B. Smith, that his plough, "The Vixen," made in June, 1876, was the pioneer. He registered his invention on February 19th, 1877. This secured him for 12 months, but on account of the difficulties and expenses attending the taking

out of patents under the old Act, he did not apply for one. Mr. J. W. Stott, formerly of Alma, claims to have made the first practicable stump-jump plough, and supplied a large number of these implements to farmers. Mr. Shapland is another who has urged his rights to be considered the inventor of the principle. Messrs. Martin & Co., of Gawler, assert that they were the first to put the idea into practical form, and that they did so at the instance of Mr. Mullen, of Wasleys, the father of the process of scrub-clearing known as "Mullenising." No matter to whom the idea originally occurred, or whether it was thought of by two or more at the same time, the stump-jump plough has, next to that of the stripper, been the most valuable invention in connection with our agricultural industry. It is a coincidence that neither of these were patented, and that the public received the benefit of them without any reduction for royalties. Mr. R. B. Smith worked very hard at his idea, and it was unfortunate for him that his implement did not immediately achieve the success it subsequently obtained, as he would have then been encouraged to take advantage of the full protection of the Patent Act. In a letter he wrote later he remarked, somewhat pathetically—"My invention has cost me some money, some anxiety, and condemned my little ones to all the miseries of poverty and banishment in the bush, whereas if I had been a successful cricketer, a good bowler, or a rifle-shooter, without pluck, a Blondin, or an acrobat, I and mine would have escaped these ills."



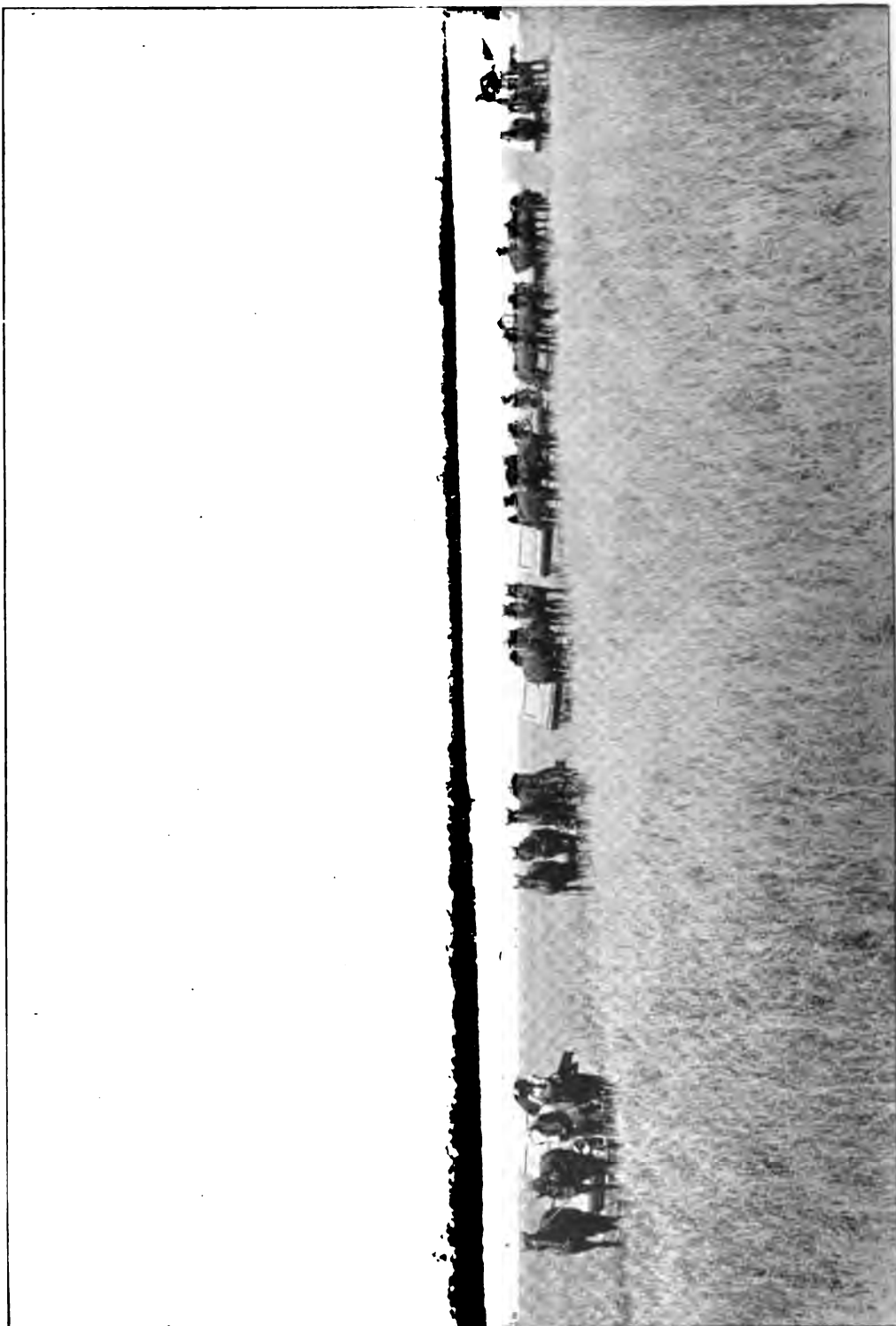
Ploughing with Multi-furrow Plough.

[W. S. Smith, Photo.]

The above shows a 12-furrow Plough working in light land. Six horses are drawing this plough, which, however, is only turning over the ground a few inches in depth.

In 1882 Parliament voted Mr. Smith £500. Perhaps no one has done more than did the late Mr. C. H. Smith, of Ardrossan, to improve the stumpjumper and make it the popular implement it is to-day. Messrs. R. B. and C. H. Smith were working together in 1876, and it was from the interchange of ideas between the two brothers that the first stumpjumper is said to have originated. Certain it is that Mr. C. H. Smith is entitled to much credit for the present position which this implement occupies. His factory is now under the control of his sons.

Professor Lowrie observed in one of his annual reports—"Our leading farmers are satisfied that they get a better seed bed by the use of the multiple plough in place of the scarifier. On land where the dandelion or Cape weed is plentiful it will be found far superior to the scarifier as a means of cleaning the fallows in autumn, and, indeed, wherever there is a growth of vegetation fairly established, and especially in damp weather, the scarifier is not in it with the multiple plough." The improvements which South Australian manufacturers have effected in the plough, and its kindred cultivators, the scarifier and harrows, must have cheapened the cost of cultivation very considerably. The introduction of the seedsower, which has displaced the old and laborious process of hand-seeding, has also saved valuable time and secured greater efficiency. The net result of these improved "aids" to agriculture has been a substantial reduction in the cost of production, and has added interest to farming pursuits in South Australia.



(PL. XII.)

HARVESTING A WHEAT CROP.

[Chas. F. Scott, Photo.]

CHAPTER XII.

CULTIVATION OF CEREALS.

NOW that South Australia is a large exporter of cereals, the value of shipments of breadstuffs during the past decade having exceeded £14,500,000, it is instructive to note that on September 7th, 1839, an Act was passed "in Council" and signed by Governor Gawler, "To impose certain Rates and Duties upon Wheat and other Grain, Flour Meal, and Biscuit exported from the Province of South Australia, and to prevent the clandestine exportation of the same." The preamble sets out—"Whereas the present scarcity of wheat and flour in this province renders it most urgent for the public welfare that the improvident exportation of these articles should be checked in consequence of the constant increase of population therein, and its almost total dependence upon external supply," &c. Power was given to the Governor to "fix such



Stripping and Winnowing Wheat.

[W. S. Smith, Photo.]

rates and duties" as "shall seem fit and expedient on all cereals exported." Persons intending to ship such produce had to give four days' notice, and any omission to do this rendered them liable to forfeit the goods and "pay treble the value of the article so attempted to be shipped." The provisions of this Statute were carefully worded in order to guard against "clandestine exportation" of cereals.

The Granary of Australia.

Within 12 years of this peculiar decree grain grown in South Australia took first prize in London against the world! This was at the great Exhibition of 1851 promoted by the late Prince Consort. A few years later and this State had firmly established its claim to be regarded as the granary of Australia. From that time onward South Australian wheat has enjoyed a world-wide reputation for quality. The favorable character of soil and climate enables the farmer to develop the wheat plant to a high standard. For milling into a "straight" flour there is no grain in the world to excel that produced in this State. It commands a high

price in Mark Lane, and is in demand throughout the Commonwealth for seed purposes. The official "standard weight" of wheat annually fixed by the Chamber of Commerce of various States has averaged 62½lbs. in South Australia for 20 years, 62lbs. in Victoria for 17 years, and 61½lbs. in New South Wales for eight years.

Cultivated Area. South Australia has the largest cultivated area in proportion to population of any of the Australian States. According to the latest figures the average area in cultivation (exclusive of artificial grasses) to each person at the end of 1906 was in South Australia 8.46 acres. Victoria was next with 3.47 acres *per capita*.

It was Mark Twain who declared that "farming is healthy work, but no man can run a farm and wear his best clothes at the same time." The underlying truth in that remark has been well observed by the average South Australian rural producer. He is a hard worker.



Delivery of Wheat at a Railway Station.

The agricultural industry would not be in the prosperous condition it is were it not for the energy, skill, and enterprise of the farmer. If labor-saving machinery has helped the grain-grower to minimise the cost of production and lighten his labors, science has also come to his aid. By-products of the farm have greatly assisted in making agricultural pursuits more profitable as well as more interesting. The struggle is not such an uphill one as it was, so that a man of ordinary intelligence and a little capital can do well and live a healthy life in following farming pursuits in this State.

Production of Wheat.

The production of wheat early received the attention of the pioneer. In 1838 20 acres were under wheat. The following year about 120 acres yielded at the rate of 25bush. per acre. Wheat was worth 15s. per bushel in the local market. All doubts concerning the fertility of the soil were soon removed, but as the area of cultivation extended fresh difficulties arose. Mr. Francis Dutton, writing in 1846, said—"The farmers all knew that the land would grow corn in abundance: but they put in their grain with fear and trembling, not knowing but that when the crops were ripe the half of them might be shed before they could get sufficient

hands to reap them." The invention of the stripping machine helped to solve the labor problem, and from that time the "area under cultivation" rapidly expanded. As new hundreds were surveyed and thrown open for selection farmers moved further away from the centres of settlement, and within 20 years of the proclamation of the province breadstuffs to the value of £556,000 were shipped abroad. In 1864 exports totalled £1,464,000. The area under wheat had by that time increased to 390,000 acres. During the next 10 years the area under cultivation was more than doubled, and over 6,000,000bush. of wheat were reaped. By 1884 the acreage under grain had risen to 1,942,453, and the production was 14,621,755bush., or an average yield for the whole State of 7.53bush. Shipments of grain in 1883 reached a value of £2,491,896. The following table shows acreage sown for wheat, the total yield, and the average per acre in the seasons named :—

Year.	Acreage.	Produce.	Average.	Year.	Acreage.	Produce.	Average.
		Bushels.	Bushels.			Bushels.	Bushels.
1884-5 ..	1,942,453	14,621,755	7.53	1900-1 ..	1,913,247	11,253,148	5.88
1889-90 ..	1,842,961	14,577,358	7.91	1901-2 ..	1,743,452	8,012,762	4.60
1890-1 ..	1,673,573	9,399,389	5.62	1902-3 ..	1,746,842	6,354,912	3.64
1891-2 ..	1,552,423	6,436,488	4.15	1903-4 ..	1,711,174	13,209,465	7.72
1892-3 ..	1,520,580	9,240,108	6.08	1904-5 ..	1,840,157	12,023,172	6.53
1896-7 ..	1,693,045	2,804,493	1.66	1905-6 ..	1,757,036	20,143,798	11.46
1897-8 ..	1,522,668	4,014,852	2.64	1906-7 ..	1,686,374	17,466,501	10.36
1898-9 ..	1,788,770	8,778,900	4.91	1907-8 ..	1,723,489	19,098,547	11.08
1899-1900 ..	1,821,137	8,453,135	4.64				

The foregoing are official figures gathered by the Statistical Department of the Government. Every care is exercised by the officers in their compilation, but there is an impression abroad that the tendency of the official information collected direct from the farmers is to understate actual production. Unofficial estimates of the harvest of 1906-7 was that approximately 20,000,000bush. were produced; while the results of the 1907-8 harvest is given as 1,850,000 acres, 20,720,000bush., giving an average yield per acre of 11bush. 12lbs.

The summary of wheat-production during the past 46 years illustrates the growing importance of this industry :—

Season.	Acres.	Bushels.	Average Yield.	Mean Annual Rainfall (Adelaide).	SHIPMENTS BREADSTUFFS.		Average Price per Bushel (Port Adelaide).
					Tons.	Value.	
						£	
1861-1865	353,600	19,785,248	11.20	21.03	329,762	4,748,831	6 7
1866-1870	535,603	24,328,799	9.08	19.15	342,748	4,220,176	5 4
1871-1875	795,112	39,484,334	9.93	22.63	711,280	7,471,992	5 2
1876-1880	1,348,973	47,091,784	6.98	20.67	811,633	8,311,589	5 4
1881-1885	1,837,226	49,875,134	5.43	18.95	941,018	7,921,981	4 7
1886-1890	1,808,307	60,010,747	6.64	22.26	1,032,777	8,192,353	4 0
1891-1895	1,558,724	43,005,181	5.52	19.81	728,492	4,618,714	3 4
1896-1900	1,747,773	35,304,528	4.04	18.37	589,397	3,470,630	3 6
1901-1905	1,759,732	59,744,289	6.79	20.42	1,262,681	8,580,259	3 8
1906-1907	1,686,374	17,466,501	10.36	26.51	438,415	2,784,854	3 6
1907-1908	1,723,489	19,098,547	11.08	—	—	—	—

During the 46 years (1861-1906) the total number of acres of wheat sown was 60,411,627 acres, off which 396,096,545bush. were reaped, giving an average yield for the acreage sown of 6.56bush. per acre. The average rainfall (Adelaide) was 20.55 inches. The quantity of breadstuffs shipped during the same period was 5,487,107 tons, of the total value of £48,956,268, and the average price of wheat at Port Adelaide 4s. 9d. per bushel. The table affords an opportunity of comparing the results of the first 20 years (1861-1880) with those of the following 25 years, and of tracing some of the movements in wheat-growing in that period. During the first half 15,166,441 acres were sown, producing 130,690,165bush., averaging 8.62 to the acre, the average rainfall being 20.87 inches; 2,195,423 tons of breadstuffs were exported, £24,752,588 value, the price

of wheat averaging 5s. 7d. per bushel. In the next half 34,760,151 acres were sown, yielding 188,195,590 bush., or 5.41 bush. per acre; the average rainfall was 19.85 inches, and 3,291,684 tons of breadstuffs, value £24,203,680, were shipped, the price of wheat averaging 3s. 10d per bushel.

Cost of Production. It will be interesting at this stage to inquire what is the average cost of production. There are few countries where the cost of growing cereals is lower than it is in South Australia. Mr. T. A. Coghlan, the late Statistician of New South Wales and now Agent-General in London for that State, writing in 1896, said—"Owing to favorable conditions of culture, a yield of 7 bush. in South Australia is financially as satisfactory as one of 15 bush. in New South Wales, or of 20 bush. in New Zealand." This was the experience almost from the first, but in later years economies on the farm have been made possible as the result of the introduction of labor-saving machinery. Mr. Coghlan's statement is confirmed by the experience of Professor Lowrie, at one time head of the Agricultural Department in South Australia and now Principal of the Lincoln Agricultural College. In giving evidence in a case brought by the Canterbury Agricultural Laborers' Union against the farmers for higher wages, he said—"Many people hopelessly overestimated the results which a farmer got from his property. He doubted very much whether the average farmer in Canterbury, working on land at its present selling value, had an income of 6 per cent. on the capital value after his own labor had been given in free. On coming to New Zealand six years ago he had expected to find more profitable conditions, especially when the yields of the farms were stated at about 90 bush. of oats to the acre and 60 bush. of wheat, but the conditions under which these results were obtained, the high price of land, the cost of labor, and the amount of labor required made the story read considerably different. Working £6,000 worth of land in Australia, his total sales were greater than when he worked £27,000 worth of land in New Zealand." The reference to Australia is really to Roseworthy College, where the land is not regarded as first-class.



Stack Containing Over 500,000 Bushels of Wheat at Wallaroo.

[Cont. Photo.]

A prominent farmer was paid in the early days £1 an acre for harvesting with a sickle and 1s. a bushel for threshing with a flail, equal to £2 an acre for a 20bush. crop. Taking figures made public by the late Captain Bagot as a basis, the cost (minus rent, taxes, and seed) in 1842 worked out thus :—

	£	s.	d.
Ploughing and sowing, per bushel	0	0	5
Harvesting	0	2	0
	<u>£0</u>	<u>2</u>	<u>5</u>

In 1843, with the Ridley reaper, the cost per bushel figured out as follows :—

	£	s.	d.
Ploughing and sowing	0	0	5
Harvesting	0	0	3½
	<u>£0</u>	<u>0</u>	<u>8½</u>

A few years ago a leading farmer on Yorke's Peninsula published some interesting statistics concerning the cultivation of 1,000 acres of land by himself. The particulars were in detail, and bore the impress of actual experience. The mechanical operations of his farm cost him as follows :—

	£	s.	d.
Ploughing, per acre	0	2	3½
Sowing	0	0	2
Harrowing	0	0	7½
Reaping	0	1	5½
Winnowing	0	0	5
Cost per acre	<u>£0</u>	<u>4</u>	<u>11½</u>

This was generally regarded as being below the cost of the average farm in South Australia. The following estimate was given by a well-known farming authority in the Lower North, where holdings are smaller :—

	£	s.	d.
Cultivation, including ploughing, scarifying, harrowing, providing for fallow	0	8	3
Sowing	0	0	10
Reaping (say 18bush.)	0	4	6
Winnowing	0	1	10
Total per acre	<u>£0</u>	<u>15</u>	<u>5</u>

Or 9½d. per bushel. This may be taken as a fair estimate of the purely mechanical operations of the farm in those districts where temporary soil exhaustion was a few years ago plainly indicated. Another estimate, made by a farmer of the Lower North, places the cost of wheat production on fallow land as follows :—

Land cropped every third year—		£	s.	d.
One and three-quarters' rent at 5s. per acre		0	8	9
Ploughing, at 5s. per acre		0	5	0
Harrowing, at 9d. per acre		0	0	9
Cultivating, at 2s. per acre		0	2	0
Harrowing at 9d. per acre		0	0	9
Seeding.—Cultivating, at 2s. per acre		0	2	0
Harrowing, at 9d. per acre		0	0	9
Drilling, at 1s. 6d. per acre		0	1	6
1bush. of seed wheat, at 3s.		0	3	0
56-60lbs. manure		0	2	6
Harvesting, at 5s. per acre		0	5	0
Bags and twine		0	2	6
Carting, at 4d. per bag		0	1	8
		<u>£1</u>	<u>16</u>	<u>2</u>
Eighteen bushels of wheat at 3s. per bushel		2	14	0
Leaving a credit balance of		<u>£0</u>	<u>17</u>	<u>10</u>

Production at 18bush. per acre and price at 3s. are both moderate. The transformation which has taken place in methods of farming of recent years has reduced costs to the farmer, and has made small holdings financially possible. A farmer not 50 miles north of Adelaide, where there are a number of holdings of from 200 to 500 acres in extent, undertook not long ago to prove what it was possible to make on a farm of 350 acres by cereal-growing, it being understood that the farmer had his live stock and implements. Half the land was to be cropped each year, and the other half left fallow. Allowing six acres for house, garden, stables, and other buildings there would be 172 acres under crop each season. Allowing that over an average of years 80 acres would be cut for hay and 92 acres left for wheat, and figuring on fair prices, costs worked out thus—

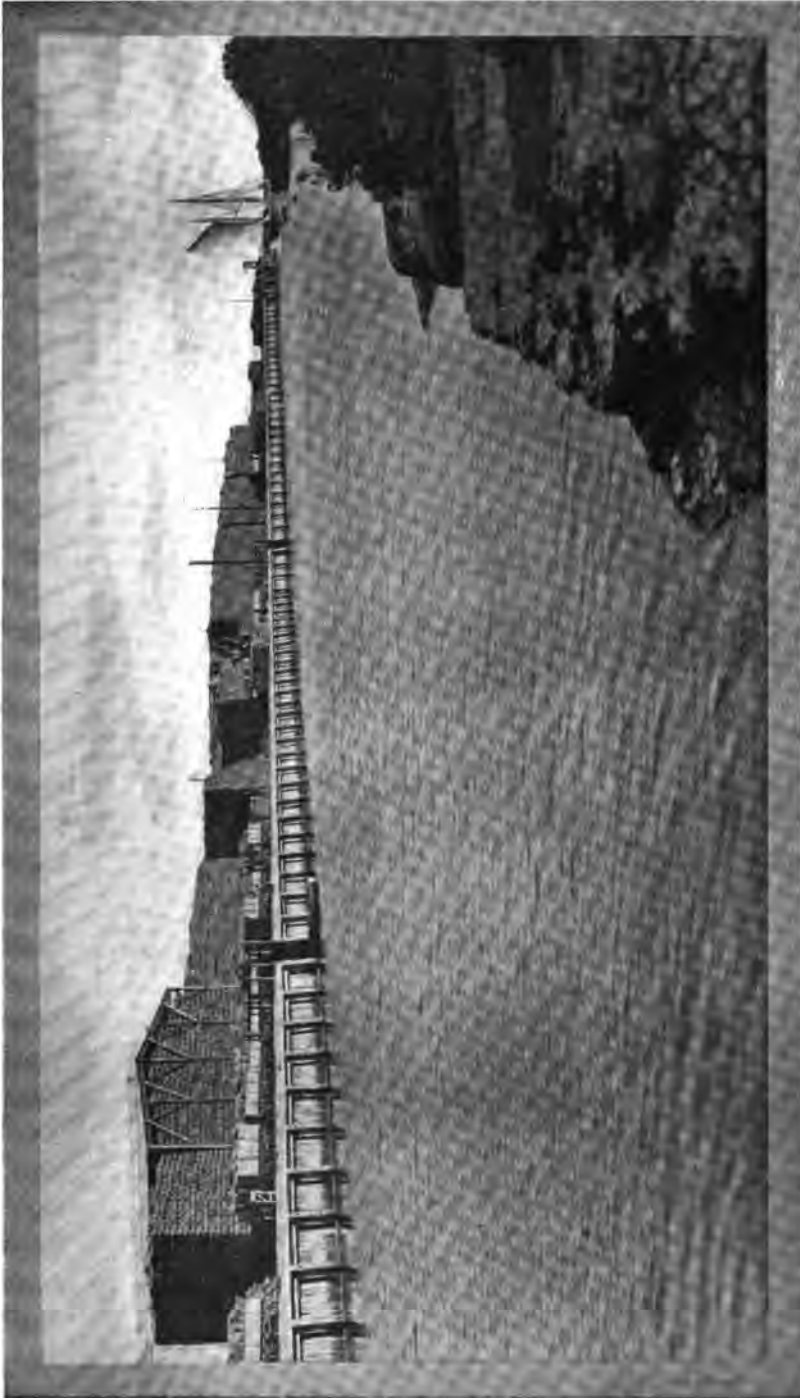
172 acres—						£	s.	d.
Manure, at lowt. per acre, at £4 per ton	..	..	..	..	..	34	8	0
99½bush. wheat (66½ba. per acre), at 3s. per bushel	..	..	..	..	..	14	19	0
60bush. oats (1½bush. per acre), at 2s. 3d. per bushel	..	..	..	..	..	6	15	0
30 tons hay for live stock, at 30s. per ton	..	..	..	..	..	45	0	0
400 wheat sacks, at 7s. per dozen, and 7 bales twine at 5½d. per pound..	..	..	..	..	..	21	14	7
Blacksmith, for repairs	..	..	..	..	..	9	0	0
Saddler	..	..	..	..	..	3	0	0
Wages at harvest time (man)	..	..	..	..	..	13	10	0
“ “ (lad)	..	..	..	..	..	4	10	0
“ at seed time (lad)	..	..	..	..	..	4	4	0
Water rates	..	..	..	..	..	5	8	3
District rates and land tax	..	..	..	..	..	6	0	3
10 acres sown for seed	..	..	..	..	..	3	12	3
Sundry	..	..	..	..	..	10	0	0
Total	..	..	..	..	..	£182	1	4

Against this were the following receipts:—

	£	s.	d.
92 acres of wheat (18bush. average), at 3s. per bushel	248 8 0
80 acres hay (2½ tons per acre), at 30s per ton	270 0 0
Total	£518 8 0
Credit balance	£336 6 8

The cost per acre works out at £1 1s. 2d. No allowance has been made in these calculations for the upkeep of horses and implements; but, as regards the latter, it is contended that in from 15 to 20 years the farm should be able to replace those worn out. Another estimate which allows for wages at current (high) rates, cost of seed, manure, &c., puts the cost of production at 25s. per acre. The figures vary according to locality and methods of working.

In 1905 *The Register* instituted through its columns an inquiry into the cost of growing wheat. In the Middle North the cost of an acre of wheat on fallow land was worked out at £1 9s. 7d., a profit of 18s. 10d. per acre, or of 1s. 2d. per bushel being shown. Depreciation on stock and implements was allowed for. "I am satisfied," remarked one correspondent, "that wheat can be grown profitably at 2s. 6d. per bushel, after allowing for all reasonable expenses." Another correspondent further north gave a decided affirmative to the inquiry whether wheat-growing pays in South Australia, and gave the following figures to prove his contention:—Six hundred acres—Rent at 5 per cent. or £2 per acre, 2s. per acre if the whole were cultivated and 4s. if only half; ploughing 200 acres for fallow, 1s. 6d. per acre; cultivating twice, 1s.; manure, 3s. 6d.; drilling, 6d.; cost of harvesting, including bags, 3s.; cost of cultivating 100 acres of stubble once, 6d.; manure, 2s.; drilling, 6d.; harvesting, including bags, 3s.; seed for whole, 1s. 9d.; hay for feed, 1s. 9d.; hay for feed, 20 acres. This gives an average of 12s. 9d. per acre for 300 acres cultivated, with an average of 7bush. and wheat at 3s. per acre. A return of 21s. per acre would leave a profit of 8s. 3d. per acre, out of which taxes, &c., and cost of stock would have to be paid. Other correspondents, without entering into elaborate calculations, came to the conclusion that where an average of 8bush. could be secured, and wheat ruled at not less than 3s. per bushel, wheat-growing is a profitable occupation.



Shipments of wheat are made from various ports in proximity to the wheat areas, thus lessening transit charges to a material extent. The following table shows the quantities of wheat exported in 1907 from the respective ports:—

	Bushels.		Bushels.		Bushels.
Port Adelaide.....	4,237,631	Port Germein	715,360	Tumby Bay	109,548
Port Wallaroo.....	2,696,133	Port Victoria	525,976	Franklin Harbor	93,613
Port Pirie	2,612,716	Port Wakefield	358,316	Streaky Bay.....	71,556
Port Augusta	930,787	Port Broughton	232,313	Point Turton	56,847

[Cont. Photo.]

Cereal and Some Other Crops.

The extent of land under cultivation and the description of crop are shown in the following:—

CROP.	ACRES UNDER CULTIVATION.									
	1897-8.	1898-9.	'99-1900.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6	1906-7.
For Grain—										
Wheat.....	1,572,668	1,788,770	1,821,137	1,913,247*	1,748,452†	1,748,842	1,711,174	1,840,157	1,737,036	1,681,982
Barley.....	12,232	16,961	15,767	15,352	15,317	21,493	28,697	23,904	28,350	28,122
Oats.....	31,398	25,823	20,229	27,988	34,680	50,296	57,558	50,630	56,950	57,000
Peas.....	2,917	3,491	3,842	4,454	4,988	5,452	6,461	7,078	6,690	7,109
For Green Forage—										
Wheat, Oats, &c.	1,266	1,252	1,104	3,009	2,172	2,096	2,371	1,964	3,338	2,930
Lucerne.....	7,452	8,899	11,356	10,127	11,523	12,841	16,970	16,399	20,504	15,055
Sown Grasses.....	30,083	20,946	21,593	22,186	23,510	23,636	24,118	24,912	26,082	23,679
Other Crops										
Hay.....	449,167	316,413	311,440	341,330	369,796	325,789	370,152	369,626	317,924	295,895
Potatoes.....	6,449	6,653	8,406	6,628	6,248	7,763	8,616	8,315	9,540	9,894
Orchard.....	13,054	14,396	15,477	16,001	16,315	17,376	18,726	18,872	19,320	18,199
Garden.....	7,574	7,994	8,324	8,830	9,005	9,489	9,964	10,160	10,688	8,397
Vineyard.....	18,761	19,159	19,438	20,158	20,680	21,692	22,617	23,310	23,603	22,575
Fallow Land.....	507,484	734,610	522,013	887,540	862,738	888,946	1,010,141	1,016,156	1,087,057	1,063,921
Total.....	2,604,122	2,967,370	3,081,846	3,279,406	3,122,800	3,137,175	3,291,083	3,316,574	3,368,708	3,230,891

*Owing to drought 339,230 acres were not reaped.

† 169,795 acres less wheat sown, 28,466 acres more hay cut, and 299,348 acres not reaped owing to drought.

In the following table is shown the gross produce and average yield of the various crops:—

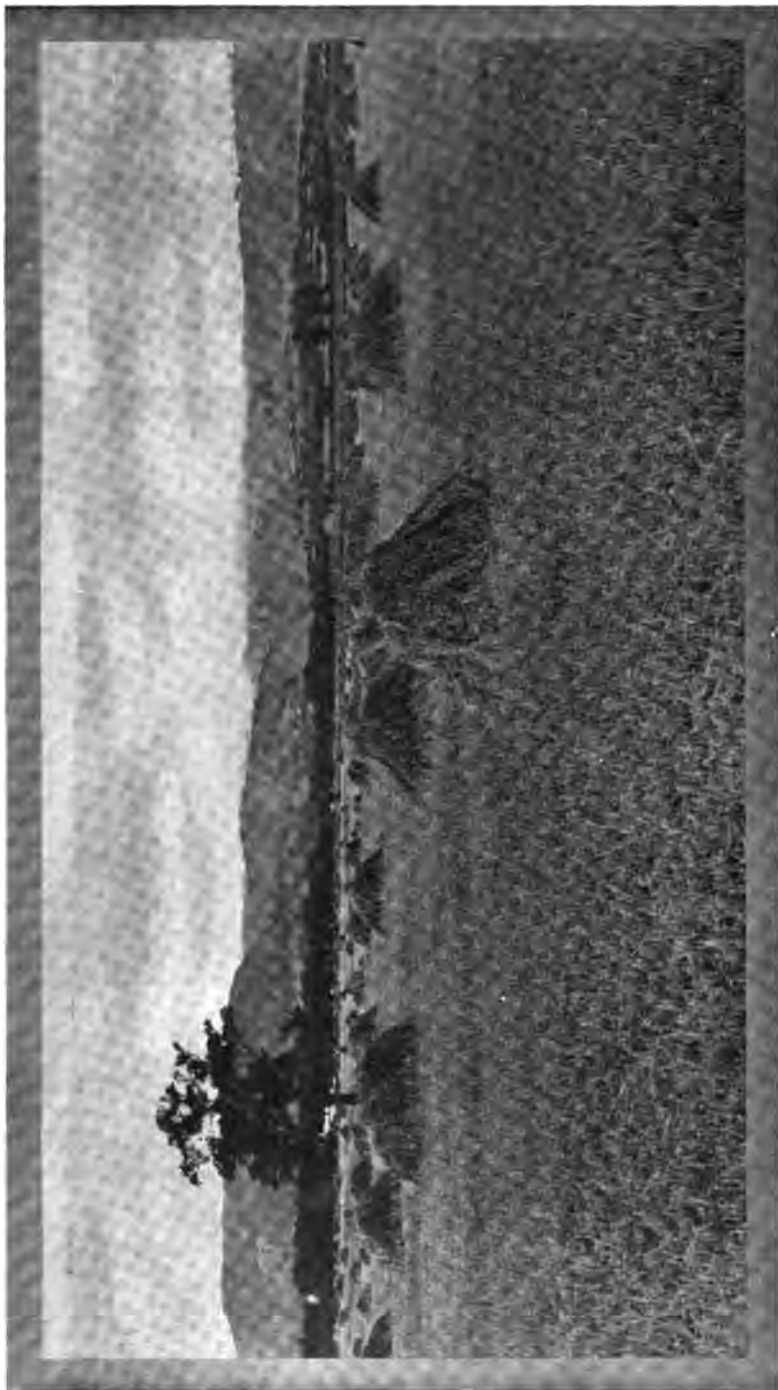
Year.	Wheat (bushels).		Barley (bushels).		Oats (bushels).		Peas (bushels).		Hay (tons).		Potatoes (tons).		Wattle Bark (tons).
	Produce.	Avg.	Produce.	Avg.	Produce.	Avg.	Produce.	Avg.	Produce.	Avg.	Produce.	Avg.	
1889-90.....	14,577,358	7.91	246,841	12.54	131,449	12.77	57,800	13.55	395,920	1.20	23,553	3.74	—
1900-1.....	9,399,309	5.62	175,88	12.13	116,229	9.32	64,068	14.70	310,125	.90	23,963	3.62	4,372
1891-2.....	6,436,488	4.15	107,183	9.35	80,876	6.40	68,655	16.00	193,317	.64	27,824	4.04	2,904
1892-3.....	9,240,108	6.08	175,468	13.21	166,489	10.57	69,922	14.86	389,277	.90	20,057	3.34	3,131
1896-7.....	2,804,493	1.86	107,798	7.44	189,716	4.73	30,350	8.62	170,808	.50	16,139	2.52	5,030
1897-8.....	4,014,352	2.64	162,065	12.25	204,444	6.51	31,936	10.95	296,184	.66	9,308	1.44	6,830
1898-9.....	8,778,900	4.91	234,135	13.00	304,002	11.77	51,151	14.65	252,518	.82	14,445	2.17	8,217
1899-1900.....	8,453,135	4.64	188,917	11.98	218,331	10.79	32,883	13.76	229,800	.74	19,716	2.35	8,038
1900-1.....	11,253,148	5.88	211,102	13.75	366,229	13.09	67,415	15.14	353,662	1.03	14,566	2.20	8,330
1901-2.....	8,021,762	4.80	243,362	16.68	469,254	13.51	97,577	19.76	346,467	.94	15,039	2.41	8,566
1902-3.....	6,354,912	3.63	317,155	14.79	620,823	10.35	69,654	16.62	308,825	.95	28,312	3.63	9,212
1903-4.....	13,208,465	7.72	467,920	17.00	902,936	15.69	121,580	18.80	479,723	1.30	31,415	3.65	8,170
1904-5.....	12,023,172	6.53	346,718	14.50	555,696	10.98	93,818	13.25	294,253	1.09	19,521	2.96	7,343
1905-6.....	20,143,798	11.46	505,916	19.27	869,146	15.26	120,340	18.00	435,546	1.37	20,228	3.13	8,506
1906-7.....	17,466,501	10.36	491,246	17.46	896,166	15.72	140,367	19.14	398,866	1.34	22,277	2.35	7,274

Rainfall and Crops.

The question of rainfall is of great interest to farmers in South Australia, though mere figures showing the annual precipitation are misleading unless all the circumstances are taken into consideration. Sir Charles Todd, when Government Meteorologist of South Australia, well said—

"We have to look, not so much at the quantity of rain which falls in any year—which may be swelled by summer storms—nor even at the mean annual rainfall, but at the general distribution of the rain, or the months in which rain may be looked for in sufficient quantities to adequately reward the labor expended in cultivating the soil." He further remarks—"We cannot, as a rule, expect a good harvest without copious rains in the period May to October. The total rainfall for the year may, however, be comparatively small, and yet the harvest good (as in 1864, when it only averaged 18.83in., taking the whole of the agricultural districts), provided the rainfall is ample in the six months just specified. On the other hand, the total rainfall may be large, but the yield small, if the winter rainfall is deficient, or if heavy rains and adverse atmospheric conditions occur late in October, November, and December, as was the case in 1871, when the rainfall averaged 23.25in., and the yield was only 5bush. 45lbs." Fallowing and the adaptation of the Campbell system of dry farming are doing much to make wheat-growing profitable with a minimum quantity of rain.

HAYFIELD NEAR THE CITY, SHOWING MOUNT LOFTY RANGE IN BACKGROUND.



[Inset Photo.]
The annual hay crop varies from 300,000 tons to 500,000 tons, of an average annual value of between £400,000 and £600,000. A considerable export trade is done with several of the neighboring States.

Hay.

Hay-growing is a popular and profitable auxiliary to the production of grain. Fields sown for wheat are for various reasons—mostly because hay at harvesting time promises to pay better—cut for hay. On this account the acreage devoted to hay fluctuates considerably. At the same time there are districts, particularly to the south of Adelaide, where hay as fodder is regularly grown. During the last few years chaff mills have sprung up all over the State, while compressed fodder works have been erected. The compressed fodder industry, however, has not advanced, as was hoped would be the case. According to latest official returns there are 76 chaff-cutting mills in the State, with machinery equal to 944 horse-power, and employing 938 hands. Large exports of chaffed hay have taken place to other States and South Africa. The quantity of hay cut last season was estimated at 395,766 tons. In some years prices have gone to £5 and even £7 per ton, and in many cases farmers are known to have realised as much as £3,000 to £5,000 for their hay alone. According to the official returns the total quantity of hay reaped was 395,766 tons, taken from 295,895 acres. The Central District, which is the largest producer of hay,



Hayfield Carrying a Crop of about 3 Tons per Acre.

[Govt. Photo.]

contributed 200,881 tons from 138,613 acres, and the Lower North 110,382 tons from 81,870 acres. The South-East supplied 27,928 tons from 22,490 acres; while the Upper North reaped 42,458 tons from 36,059 acres; and the Western District 14,117 tons from 16,863 acres.

The following is the official returns of the hay yields for the seasons stated, together with exports of hay, chaff, &c., from South Australia :—

Year.	Produce.	Average	Exports.	Year.	Produce.	Average	Exports.
	Tons.	Tons.	Tons.		Tons.	Tons.	Tons.
1896-7 ..	170,808	.50	4,178	1902-3 ..	308,825	.95	70,768
1897-8 ..	298,184	.66	8,916	1903-4 ..	479,723	1.30	25,861
1898-9 ..	258,518	.82	10,965	1904-5 ..	294,252	1.09	30,462
1899-1900 ..	229,800	.74	9,185	1905-6 ..	435,546	1.37	68,866
1900-1 ..	353,662	1.03	23,981	1906-7 ..	398,866	1.34	58,517
1901-2 ..	346,467	.94	98,382	1907-8 ..	314,406	1.16	—

Oats. The cultivation of oats receives considerable attention on Yorke's Peninsula, where last season 9,296 acres were sown, from which 109,081bush. were gathered. The largest producer is the South-Eastern District, of which Mount Gambier is the centre. The acreage there was 15,271, but so prolific was the harvest that no less than 299,966bush. were reaped. There are two oatmeal factories at Mount Gambier, where the bulk of the oatmeal consumed in the State is manufactured. Oats grow luxuriantly in the South-East, where there is great scope for the expansion of what appears to be a profitable industry. The total area under oats last harvest was 57,000 acres, which produced 896,166bush., as against 869,146bush. the previous year. The following is the official statistics of the production of oats for the seasons stated :—

Year.	Produce.	Average.	Year.	Produce.	Average.
	Bushels.	Bushels.		Bushels.	Bushels.
1890-1	116,229	9.32	1900-1	366,229	13.09
1891-2	80,876	6.40	1901-2	469,254	13.54
1892-3	166,489	10.57	1902-3	620,823	12.34
1896-7	189,716	4.72	1903-4	902,936	15.69
1897-8	204,444	6.51	1904-5	555,696	10.98
1898-9	304,002	11.77	1905-6	869,146	15.26
1899-1900	218,331	10.79	1906-7	896,166	15.72

Last year's oat harvest was the largest ever reaped in South Australia. This is due partly to the increased demand for fodder purposes, and also to the manufacture in the State of break-fast foods. The Federal tariff, which governs importations of goods into South Australia, imposes a duty of $\frac{1}{4}$ d. per pound on oatmeal, rolled oats, and similar preparations, and this has had the effect of encouraging local production. In the following it is interesting to notice how demand has been met to a greater extent by the South Australian prepared commodity by setting out the imports retained for home consumption and staple exports respectively of these foods :—

Year.	Imports Retained.	Staple Exports.	Year.	Imports Retained.	Staple Exports.
	Lbs.	Lbs.		Lbs.	Lbs.
1902	355,439	210,392	1905	118,670	970,153
1903	516,796	354,963	1906	143,436	1,080,365
1904	225,088	1,040,415			

Barley. Increasing attention is being given to the cultivation of barley. The acreage under crop last year was 28,122 acres, which yielded 491,246bush., as compared with 26,250 acres, producing 505,916bush. in 1905-6. The following show the production and average yield of barley :—

Year.	Produce.	Average.	Year.	Produce.	Average.
	Bushels.	Bushels.		Bushels.	Bushels.
1890-1	175,583	12.13	1900-1	211,102	13.75
1891-2	107,183	9.35	1901-2	243,362	15.68
1892-3	175,468	13.21	1902-3	317,155	14.76
1896-7	107,798	7.44	1903-4	487,920	17.00
1897-8	162,065	12.25	1904-5	346,718	14.50
1898-9	234,135	13.80	1905-6	505,916	19.27
1899-1900	188,917	11.98	1906-7	491,246	17.47

Nearly half the barley produced in South Australia is grown at Mount Gambier, Yorke's Peninsula, and Kangaroo Island, in each of which places conditions are peculiarly favorable. Particularly of recent years increased attention has been given to the cultivation of this cereal on Kangaroo Island, and it will be interesting to note over a series of years the increase in acreage at each of these centres :—

Year.	Mount Gambier.	Yorke's Peninsula	Kangaroo Island.	Year.	Mount Gambier.	Yorke's Peninsula.	Kangaroo Island
	Acrea.	Acrea.	Acrea.		Acrea.	Acrea.	Acrea.
1890-7	1,582	1,259	1,514	1902-3	3,455	3,032	2,124
1897-8	1,746	662	962	1903-4	3,790	4,102	2,833
1898-9	2,700	1,085	1,328	1904-5	3,458	3,913	3,138
1899-1900 ..	2,345	1,378	1,262	1905-6	3,763	4,145	3,425
1900-1	1,918	1,306	1,396	1906-7	4,861	4,194	4,280
1901-2	1,964	1,592	1,474				

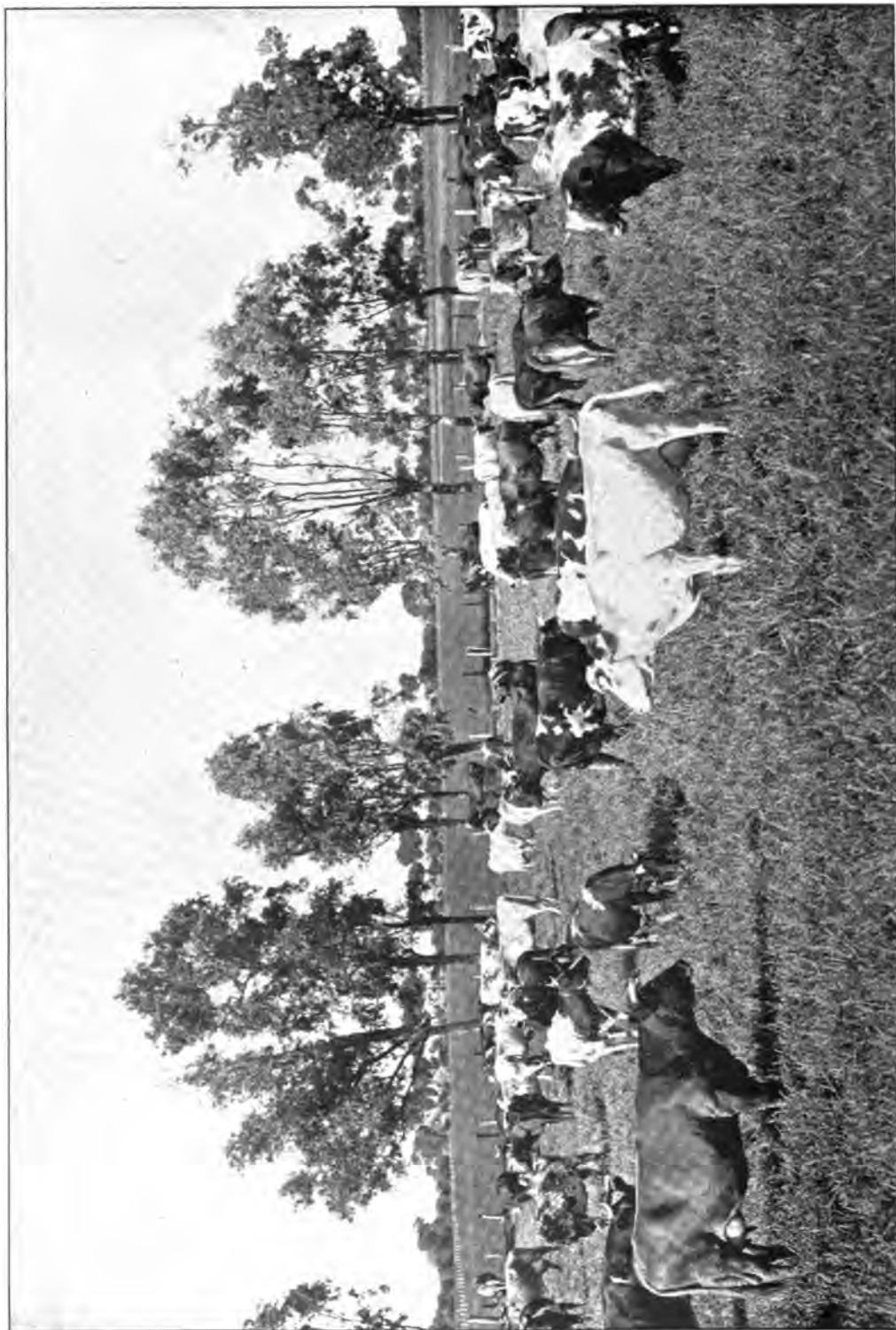
Field peas, mostly cultivated in the hilly country in the counties Adelaide and Hindmarsh, where pig-rearing and bacon-curing are chiefly carried on, is a crop which, as a rule, gives a better return than wheat, and is well known for its recuperative action on exhausted soils. It appears to have stood the drought well, as the average of 1897-8 was 11bush.; in 1898-9 it was 15bush.; in 1899-1900, 13-76bush.; in 1900-1901, 15-14bush.; in 1901-2, 19-76bush.; and last year, 19-63bush. The production and average yields of field peas is shown in the following :—

Year.	Produce.	Average.	Year.	Produce.	Average.
	Bushels.	Bushels.		Bushels.	Bushels.
1890-1	64,068	14.70	1900-1	67,415	15.14
1891-2	68,655	16.00	1901-2	97,577	19.76
1892-3	69,922	14.86	1902-3	89,654	16.44
1896-7	30,350	8.62	1903-4	121,580	18.80
1897-8	31,936	10.95	1904-5	93,818	13.25
1898-9	51,151	14.65	1905-6	120,340	18.00
1899-1900 ..	52,883	13.76	1906-7	140,367	19.63

This crop, grown in the midst of our largest dairying districts, seems to be a factor in the future expansion of the bacon industry. Out of 7,109 acres under cultivation in 1906-7 no less than 6,844 acres were in the Central District, where 135,183bush. of the total production of 140,367bush. were raised. In consequence of the intimate relation between this crop and the bacon industry it will be interesting to trace in the following table the increase in the production of peas in the Central Division of the State, the number of pigs in the same division, and the excess of staple exports of ham and bacon over imports retained for home consumption of the same commodities :—

Year.	Peas.	Pigs.	Excess Exports, Ham and Bacon.	Year.	Peas.	Pig.	Excess Exports, Ham and Bacon.
	Bushels.	No.	Lbs.		Bushels.	No.	Lbs.
1896-7	28,348	31,447	26,171	1902-3	87,503	46,202	825,872
1897-8	30,505	25,547	*14,968	1903-4	118,102	49,254	656,461
1898-9	49,175	32,444	150,491	1904-5	91,492	58,790	391,786
1899-1900 ..	51,930	44,150	269,717	1905-6	111,715	61,924	336,641
1900-1	65,696	47,040	245,603	1906-7	135,183	59,674	
1901-2	95,696	46,848	793,089				


* Excess of imports.





CHAPTER XIII.

THE DAIRYING INDUSTRY.

N many ways South Australia is favorably placed for the manufacture of butter and cheese. A reputation for choice produce has long been established and it has been maintained with increasing merit. To-day the industry is on a sound financial basis. Its monetary importance, indeed, has never been greater, and progress is such that present figures must soon be easily eclipsed. This happy position is due to the remarkable capabilities of our soils, the strong, nutritive herbage and grasses which form a rich natural food for milking stock, and the beneficial climate, combined with intelligent and painstaking zeal on the part of modern, go-ahead dairymen. Landholders all over the State are recognising that dairying is a steady, profitable branch of agriculture. Development has been rapid. In 1892—that is, within seven years of the starting of the factory system—25 factories were in operation. At present there are 76 up-to-date butter and cheese factories and creameries.

Natural Advantages. A significant feature which promises well for this industry is the splendid record of progress achieved in the Northern Areas, where severe and often erratic climatic conditions prevail. The cow, in fact, has proved the salvation of many farmers in drought-affected localities, and the returns from the dairy have more than compensated for general expenditure and losses made in other directions. "Give us enough feed for a few cows and fowls, and we can live comfortably. The rest is profit." Many have said that with the conviction of experience. An eminently satisfactory fact is the superior butter-fat quality of the milk supplies, while the attractive aroma in the cream and butter is substantial proof of the improved methods adopted by the factories. The milking herds are yearly receiving more attention, and the standard of quality is being raised. The general suitability of our climate for dairy-farming affords scope for a still wider expansion of producing operations. In the south and south-eastern portions of the State, where the rainfall exceeds 30in., and where the soil is above the average, intense culture is being practised, and with its extension the milking stock will be comfortably reared at a correspondingly smaller cost. In the volcanic country near Mount Gambier the ideal home of the dairyman is to be found, and it is questionable whether more favorable natural conditions are to be found in Australia.

An important feature of the industry is the wealth of natural herbage which grows with luxuriant vigor in many parts of the State. The rich nutriment contained in the native grasses during the warm months of summer is calculated to astonish the visitor by its rapid fattening properties for milking and other stock. Cows grazing on the plains and undulating lands yield milk of magnificent flavor, producing butter of remarkably dry texture, and unexcelled in any part of the world. "Maitland Charlotte," a champion Jersey cow belonging to Mr. Alick Murray, produced over 17lbs. of butter per week eight and a half months after calving, when her supply of food consisted solely in what the animal found in the paddocks. Another cow owned by Mr. Alick Murray, "Dinah," the champion at the Adelaide Show for two successive years, gave 45lbs. of milk, producing 3lbs. of butter, equal to 21lbs. per week. A great number of instances could be given of crossbred cattle yielding from 15lbs. to 20lbs. of butter weekly. Leading dairy-farmers do not allow their stock to entirely depend upon natural grass, but supplement with sweetly-flavored nutritious wheaten hay. Bran and meals are liberally fed, and considerable quantities of copra or cocoanut cake are also consumed.

In the production of fodders great attention has been devoted to the cultivation of lucerne. At present about 16,000 acres are under cultivation, or an increase of 9,000 acres on the figures for 1890. Sown grasses have also commanded the enterprise of the agriculturist. The turning of green crops into ensilage has, too, received attention. Many other crops are cultivated in extent according to the suitability of climate and rainfall. Among these are peas, rape, kale, cabbages, clover, maize, sorghum, and mangolds. In one of the five volcanic districts over 60 tons to the acre of mangolds have been produced without the aid of manure.

South Australia is strong in stud cattle, and several breeders have done great service for the dairying and agricultural industries of the State by producing and importing high-class animals. Throughout the milk-producing districts the profits of the Shorthorns for milk and beef production testify to their value for all-round dairying purposes. These splendid cattle

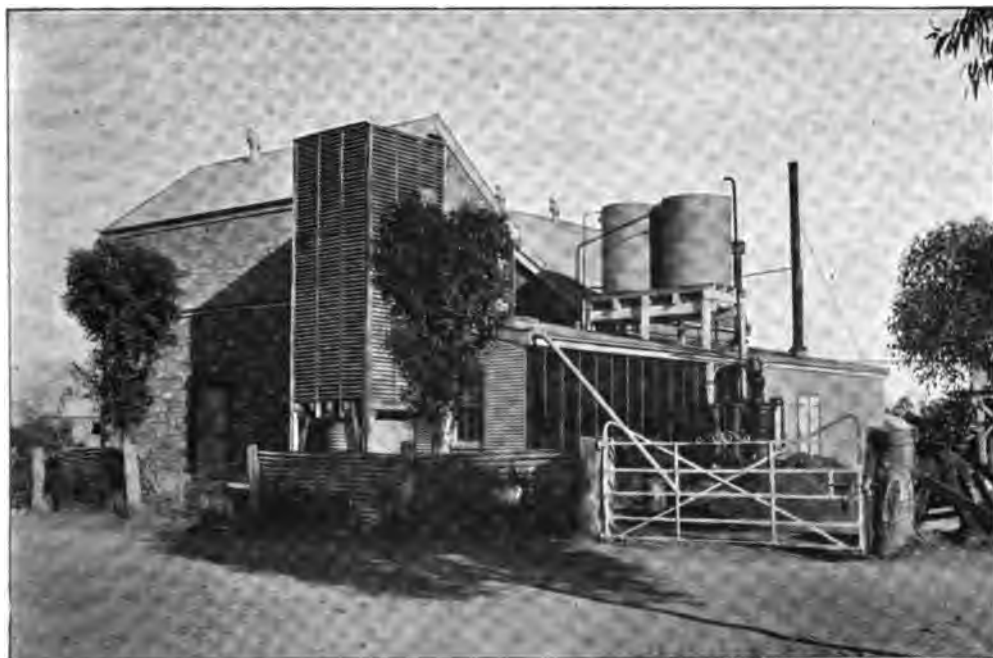


Government Butter Factory at the State Freezing Works, Port Adelaide.

[A. Vaughan, Govt. Photo.]

lose none of their characteristic features here, and probably a more congenial climate for them could not be found anywhere in the world. Jersey stock are also well represented, and the exhibition of those famous "butter machines" at our agricultural shows supplies conclusive evidence that neither expense nor attention is wanting in connection with the importation and maintenance of the breed. The Jersey is a popular animal in South Australia, and few herds are without a sprinkling of the blood. The value of this cow in the advancement of butter production cannot be accurately assessed, and it has been adequately demonstrated that the breed reaches perfection in our climate. Dairymen are rendering admirable service by proving the value and importance of the Shorthorn-Jersey cross for dairying purposes. Ayrshire, milking strains of Shorthorns, and Holstein breeds are to be found in the State. Recently there have been importations of Red Danish cattle, new Jersey blood, and Guernseys.

The Government has always been an important factor in dairying progress. At the Roseworthy College there is an excellent herd, and dairy and stud farms have been established. These will be a distinct guide to settlers as to proper methods, and important assistance will be provided by the distribution to dairymen of bulls of undoubted breeding, coming, as they will, of heavy milking ancestors. Shorthorn and Ayrshire cattle have been purchased, and the bulls are leased out on reasonable terms. This is a wise policy, and must have the effect of increasing the annual yield per cow and improving the general type of dairying stock. It is intended to run these farms as going concerns, and give young men exceptional opportunities for educational experience. The breeds to be kept will be Guernseys, Ayrshires, Shorthorns, Jerseys, and Red Polls, together with a number of good-grade stock to illustrate the effects of cross-breeding. In this way dairymen with small capital and unable to pay big figures for bulls of special milk merit will have a chance of building up a herd at reasonable expense.



A Typical Country Butter Factory.

Quality Above Everything Else:

There are in South Australia (1908) 100,000 milch cows. The quality of the milk is declared by experts to be high. Latest factory records for a year show the high percentages of butter-fat in two samples :—

January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
%	%	%	%	%	%	%	%	%	%	%	%
4.3	4.5	4.3	4.4	4.2	4.3	4.5	4.3	4.2	4.4	4.8	5.0
4.1	4.1	4.3	4.2	4.3	4.1	4.0	3.9	3.9	4.2	4.2	4.5

The aim is "quality" above everything else. These figures represent tests made at two of our largest factories, while a third factory of some prominence has given an average for the year of 4.4 per cent. of butter-fat. It is not uncommon for a factory to produce a month's

yield of butter with an average of less than 20lbs. of milk for a pound of butter during the dry season and mid-winter when food supplies are short. Instances are to be found of cows yielding milk with over 8 per cent. of fat, and 5 per cent. is a frequent occurrence.

World-wide Triumphs. South Australian butter-makers have won a high reputation in the Commonwealth and in over-sea markets. During 1907 the Government Expert (Mr. P. H. Suter) arranged with manufacturers to forward exhibits of butter to the Islington Show (London) for the purpose of competition.

The numbers of entries received from the various States were—Victoria, 36; New South Wales, 20; a few from Queensland; and seven from South Australia. The result, so far as this State is concerned, can be considered extremely satisfactory. One-half of the prizes awarded were secured, including first and third for fresh or unsalted butter, third prize for salted butter, and one exhibit was highly commended. This clearly demonstrates that South Australia can produce quite as good flavored and good keeping quality butter as can be manufactured in any part of the adjoining States.

Exploiting Foreign Markets. The rapid means of transit provided by modern ocean steamers, with their spacious refrigerating chambers, have enabled producers to place their article on foreign markets in first-class condition. The following figures, showing exports, illustrate the progress of

the dairy industry :—

Year.				Tons.	Cwts.	Year.				Tons.	Cwts.
1893-4	..	..	..	167	15	1901-2	..	..	..	86	4
1894-5	..	..	..	598	12	1902-3	..	..	..	—	—
1895-6	..	..	..	349	15	1903-4	..	..	..	229	3
1896-7	..	..	..	70	1	1904-5	..	..	..	352	8
1897-8	..	..	..	8	5	1905-6	..	..	..	590	—
1898-9	..	..	..	166	13	1906-7	..	..	..	878	—
1899-0	..	..	..	390	13	1907-8	..	..	..	620	—
1900-1	..	..	..	312	13						

Choice Cheese. In Cheddar cheese production the State holds a creditable position. Owing to the demand being in excess of the supply, an export business with England has not yet begun. The richness of the product has won the confidence of consumers, and the local market is bound to be increasingly active for many years. One authority declares that the article is equal to anything in the world. A consignment sent to Glasgow and tested when eight months old secured considerable praise from the highest authorities. When it is remembered that an average British cheese contains about 32 per cent. of fat, the superiority of the shipment is all the more apparent. The percentages were 43.95, 39.81, 39.50, and 40.74.

What Has Been Done. The accomplishments of the past always suggest hope in the future. Here is an interesting and suggestive table concerning the industry :—

Season.	Butter Made.	Cheese.	Milch Cows.	Season.	Butter Made.	Cheese.	Milch Cows.
1896-7	4,616,675	907,123	84,265	1902-3	4,521,246	705,989	75,011
1897-8	3,900,118	849,845	73,524	1903-4	5,995,756	972,584	83,438
1898-9	4,559,683	923,123	76,709	1904-5	6,836,169	851,600	88,156
1899-0	5,561,231	946,930	83,527	1905-6	8,226,805	1,174,867	93,067
1900-1	5,525,606	1,030,680	75,942	1906-7	8,873,630	1,398,785	97,843
1901-2	4,964,523	1,053,160	74,995				

The value of the dairying industry last season (1906-7) may be set down at about £500,000.

Science in the Dairy.

Indications of earnest endeavors on the part of the Government to thoroughly equip men for the dairying industry are everywhere apparent. At the Agricultural School, the preparatory institution, the student is first taught the rudiments of dairy science and practice, and at the conclusion of his elementary training he passes into the Agricultural College for the higher courses. Here he is brought into contact with the practical part of his duties, having to assist in the operations of the farm and dairy, and on the more scientific side give his attention to the work of the chemical laboratory. When he has completed his studies the young man has a knowledge which enables him to undertake the difficult work connected with factory management. At this stage in his career he is not left unaided, for the Dairy Expert attached to the Department of Agriculture visits the leading centres and conducts demonstrations on any branch of work desired by the manager. Matters demanding careful investigation—such as taint in milk, butter, and cheese, which involve the farmer and factory in heavy loss—receive attention, and at the conclusion of his inquiries the expert issues printed information dealing with the cause of the trouble, its action on the produce, and methods to obviate it. The expert has a fully equipped laboratory, where scientific work in all its branches is carried out, from the testing of factory thermometers to the bacteriological and chemical examination of samples of dairy produce.



Dairy Herd on River Swamps near Murray Bridge.

CHAPTER XIV.

FRUIT-GROWING.

SOUTH AUSTRALIA is the "Garden State" of the Commonwealth. It can be confidently asserted that no part of the world is more admirably suited to the production of the very wide range of fruits which are cultivated in temperate and sub-tropical zones than is this State. What would the horticulturists of Europe and North America think of strawberries, cherries, pears, apples, walnuts, raspberries, plums, apricots, peaches, quinces, loquats, almonds, figs, grapes, oranges, lemons, mulberries, and other varieties growing together on a 10-acre block, with no aid save the rainfall and the sunshine? Yet this is a common sight in the gardens dotted over the hills and gullies a few miles from Adelaide and elsewhere. The possibilities of fruit-production in consequence of the magnificent climate and fertile soils, are almost incalculable. Throughout the State such varying meteorological and physical conditions are encountered that every

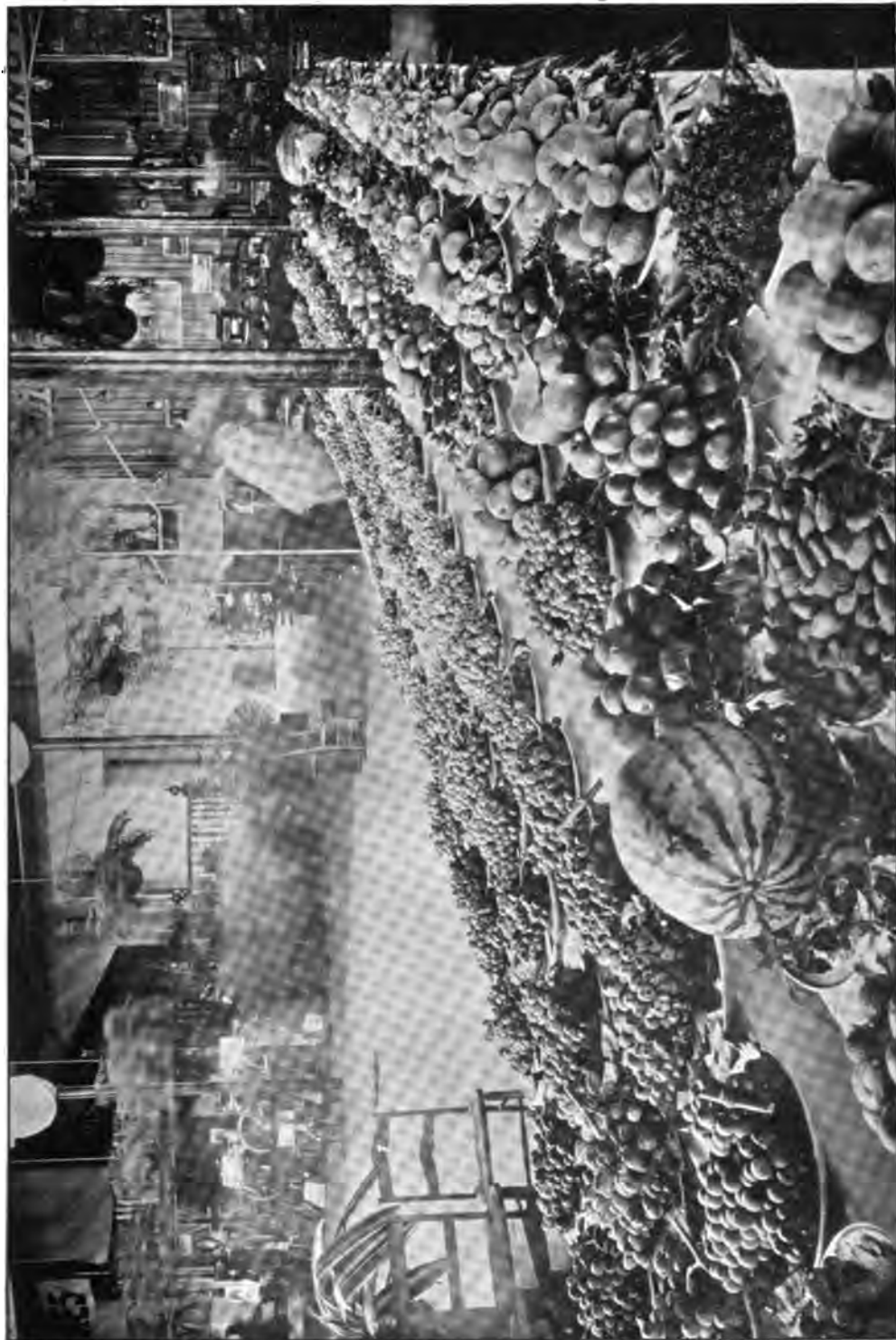


A Portion of the Largest Vine in Australia.

[R. H. Ball, Photo.]

phase of the industry is catered for, every requisite for the flavor and development of the fruit provided. The altered circumstances of the different districts enable growers to diversify production and extend the season for each variety. There is always an abundance of fruit in the shops. The produce from South Australian trees has a world reputation to be envied.

Horticulture has long since passed out of the experimental stage. From a spasmodic enterprise there has been evolved an established industry, having a firm and profitable commercial basis. The business of fruit-growing now contributes an important amount to the national revenue and employs many thousands of people. The men in it are up to date, recognising that only scientific methods and unceasing labor can win in the war of legitimate commerce. During the recent years the acreage of orchards has extended with remarkable vigor, and the scope for expansion is still great. The campaign against pests is never relaxed,



SECTION OF A FRUIT EXHIBIT AT THE ROYAL SHOW, ADELAIDE.

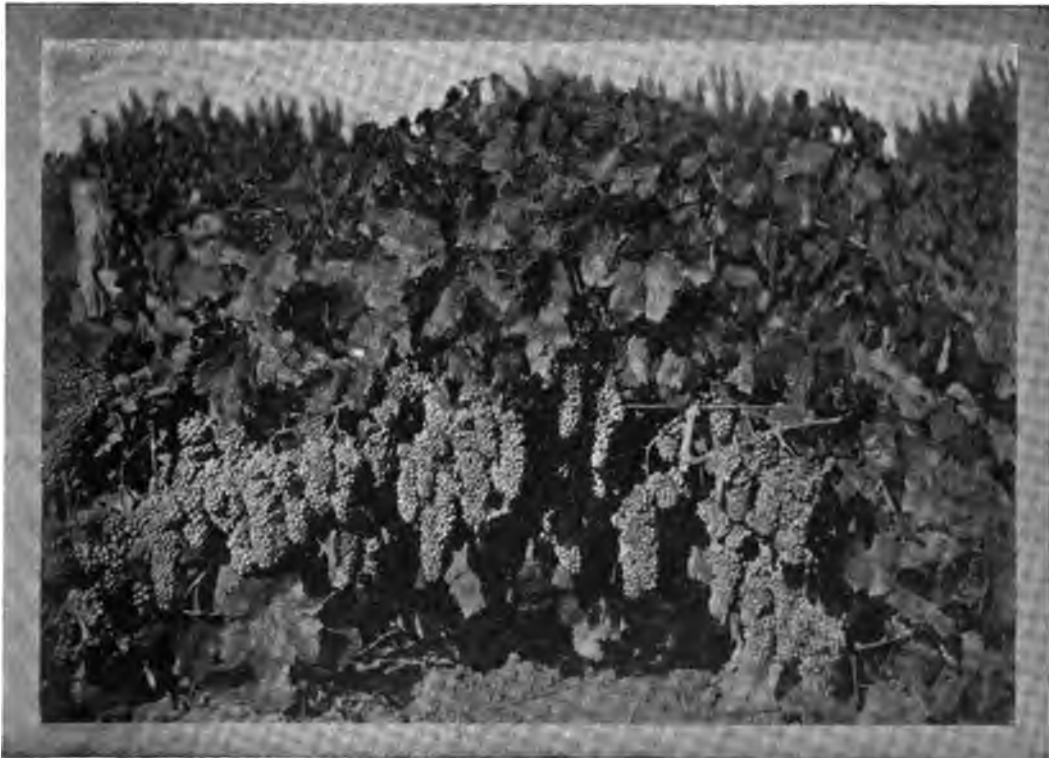
South Australian Fruit has Taken Numerous Prizes in the United Kingdom.

[Govt. Photo.]



and no cleaner gardens are to be found in the Commonwealth. There is a surplus production of many kinds of fruit, and the balance over and above requirements is exported. All European markets have been successfully exploited, and our products find their way to Africa, East Indies, and even North America.

Beginning with a few trees brought out by the pioneers from England and Cape Colony, and plants introduced from New South Wales later on, the industry slowly expanded, until the freezing chamber and improved transit facilities brought the great consuming centres of the Old World nearer to producers. The possibilities of a profitable export trade were realised, the horticulturist awoke, and at once began extending his orchards and improving his methods of cultivation. A wonderful evolution has been witnessed during the last 15 years. From "any sort of tree" the grower now makes a careful selection of the best kinds. Science has also entered



A Heavy Crop on a Currant Vine.

[Govt. Photo.]

the garden, and the successful horticulturist has become a close student of formulæ for spraying, also of the latest methods of pruning and manuring. There are colonists who remember the time when seedling peaches were produced in such abundance that the surplus supplies were fed to pigs. The export trade has changed all this and impressed growers with the importance of obtaining quality as well as quantity.

It may be said that there are three defined fruit-growing areas in South Australia—The cool, semi-humid localities embraced in the large tract of country in the elevated districts of Mount Lofty, Barossa, Stanley, and the Wirrabara Ranges, and the South-East. Here is the home of the apple, pear, cherry, prune, and all the berry fruits, which are distinguished by exquisite flavor and fine development. The rainfall varies from 25in. to 40in. annually. The second zone includes the low hill country and the plains, where the summer temperature is

higher and the rainfall from 18in. to 22in. Within this area the citrus family, stone fruits, and grapes, olive, and almond grow to great perfection. Summer irrigation is practised by the largest orchardists. The water is either drawn from the State waterworks or from natural springs. The third zone includes the valley of the River Murray, which follows a serpentine course of 600 miles through South Australia to the Southern Ocean. Fruit-growing of a distinctive character on an increasingly large scale is being carried on by means of irrigation. The raisin and the currant vine, apricots, figs, oranges, and lemons find here a congenial climate. Sun-dried fruits of excellent flavor are being produced in large quantities, the clear, dry heat preserving the natural bloom and aroma of the fruit. There are evaporation factories in the fruit-growing districts, and this process of drying is largely favored. Preserving and jam-making establishments also account for a large annual home consumption, and South Australian preserved fruits and jams find a ready demand in Australia and abroad.

Fruit-growing in South Australia has taken a high place among the primary industries. Growers have entered vigorously into competition for the world's markets, and have won considerable success. Inter-State interchange, too, has advanced in a remarkable way, and the export business was never on a surer footing. Within the last decade the production of dried fruits, such as raisins and apricots, has exceeded the local demand. The growers of currant and sultana vines are making a bold bid to exclude the imported fruits by placing upon the markets of the Commonwealth a locally grown article of superior excellence. Fifteen years ago the export of fresh fruit to London comprised a few scattered cases of apples sent in a spasmodic manner by one or two venturesome growers. Now the trade has reached large and profit-increasing dimensions.

The success obtained by shippers of apples has encouraged experiments to be made with fresh grapes, oranges, and pears with the most satisfactory results. An increased area of country is being planted with fruit trees, the horticulturist having been satisfied that he can easily overcome his natural enemies, and that increased transport facilities will help to guarantee to him a regular and profitable outlet for his produce. The following is the official return of the area represented by "gardens" and "orchards" (vines are not included) :—

Year.	Gardens.	Orchards.	Year.	Gardens.	Orchards.
	Acres.	Acres.		Acres.	Acres.
1884-5	4,942	5,825	1899-1900	8,524	15,477
1889-90	5,763	7,437	1900-01	8,830	16,001
1890-1	6,626	8,736	1901-2	9,005	16,315
1891-2	5,494	8,928	1902-3	9,489	17,376
1892-3	5,853	9,918	1903-4	9,964	18,725
1896-7	6,669	11,746	1904-5	10 160	18,872
1897-8	7,574	13,054	1905-6	10,688	19,320
1898-9	7,994	14,396	1906-7	12,520	20,150

The following shows the growth of the export trade in fresh fruit and South Australian jams :—

Year.	Fresh Fruit.	Jams.	Year.	Fresh Fruit.	Jams.
	£	£		£	£
1893	21,164	9,671	1900	42,567	16,245
1894	16,817	15,085	1901	62,662	20,499
1895	17,299	17,661	1902	37,315	16,783
1896	19,567	21,548	1903	60,695	17,572
1897	29,968	20,889	1904	75,487	21,532
1898	22,211	12,523	1905	82,040	20,695
1899	32,842	10,063	1906	77,163	24,394

The Apple Industry.

South Australia produces apples of prime quality which commend themselves highly to English palates. The growing of what is often called the "king of fruits" is no longer an experiment in this State, nor is the export trade on its trial. Both are established successes. The questions which are engaging the attention of producers, merchants, and experts have reference to the best varieties to be cultivated, methods of shipment, and the cheapest and most effective systems for waging war against pestiferous insects. Here, again, important advance has been made. The industry has had its "ups and downs," partly owing to the cultivation of varieties not suitable for distant markets, whilst planters have had to contend against unfavorable seasons. But they have come through these difficulties triumphantly, and now enjoy the satisfaction of having their produce highly praised and strongly competed for by buyers in Covent Gardens as well as at other centres. Our apples, in fact, have established in England a record price for Australia. The manager of the State Produce Depot in the English capital has reported a "very marked improvement generally in the selecting, grading, and packing," and this judg-

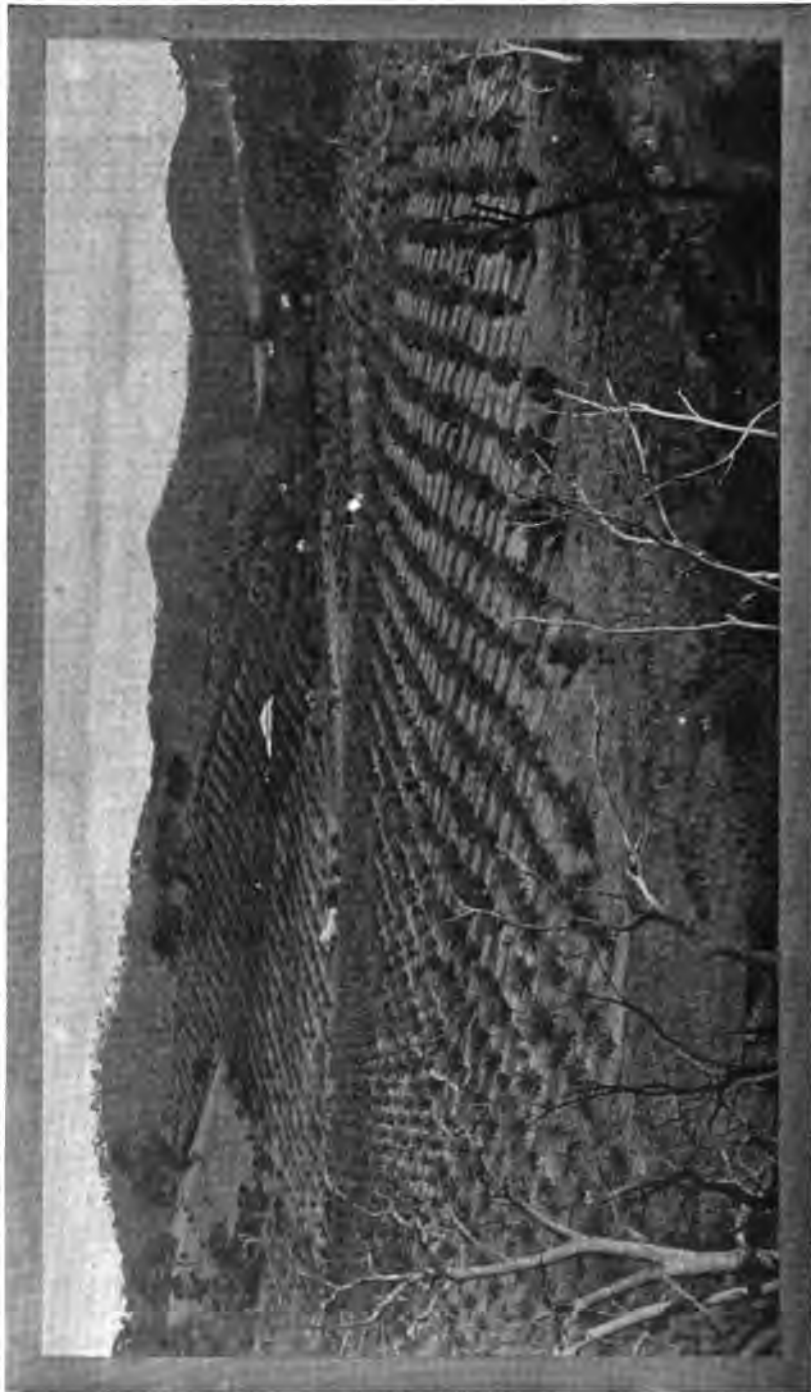


Packing Apples for Export

[R. H. Ball, Angaston, Photo.]

ment is confirmed by the Victorian produce representative, who has declared that the South Australian apples "invariably reach London in better condition than those from Melbourne and Hobart." Equally favorable comments have been passed on the quality of our fruit by colonists resident in England, who have critically sampled shipments and closely watched the improvement in quality and methods of packing. The successful inauguration of the industry and of the export trade has been accomplished. Old growers have extended their operations under improved methods, and new orchardists have entered the business in large numbers. The days of scepticism have long since passed. There is ample evidence available that new orchards have been extensively planted, and that growers are well satisfied that a profitable outlet can be found for all the fruit of good quality that they can grow. Mr. Quinn, the State Horticultural Expert, says "producers have come to realise that cleanliness, like honesty, is, after all, the best policy, and they are more and more systematically applying methods recommended by the experts to check disease."

A VIEW OF APPLE-GROWING COUNTRY NEAR KERSBROOK.



[Govt. Photo.]

South Australia has a considerable area devoted to apple trees, and there is room for a large expansion of this industry. An English orchardist of many years' experience stated recently that he had visited various fruit districts in Canada, United States, and Australasia, and nowhere did he find better prospects for extension of the apple industry than exist in South Australia.

The following shows the production so far as apples are concerned :—

Year.				Trees.	Cases.	Year.				Trees.	Cases.
1903-4	..	..	..	586,217	326,324	1905-6	..	..	..	753,540	405,223
1904-5	..	..	..	688,031	362,436	1906-7	..	..	..	755,930	407,215

About 1897 an attempt was made to export apples on a commercial scale to England, and so great was the success achieved that not only was an immediate outlet found for a surplus which was beginning to trouble growers, but also a stimulus was imparted to fresh planting. Many of the trees which were put in because of the encouraging results which followed the first export of apples oversea are now coming into full bearing, and the export trade is still expanding, other markets having been added to that of Great Britain. Exports in the 1907-8 season were, approximately, 150,000 cases, which constituted a record. In the following is shown destinations of apple exports from February to April in the past three seasons :—

							1906.	1907.	1908.
							Cases.	Cases.	Cases.
London ..	..	..	..	..	..	..	47,228	14,689	108,290
Liverpool ..	..	..	..	..	..	..	280	763	2,002
Total United Kingdom ..							47,508	15,452	110,292
Hamburg ..	..	..	..	..	..	..	16,337	2,792	13,970
Bremen ..	..	..	..	..	..	..	1,395	270	3,464
Antwerp ..	..	..	..	..	..	..	25	50	624
Genoa ..	..	..	..	..	..	..	1,336	—	1,000
Various ..	..	..	..	..	..	..	2,371	—	—
Total Europe ..							68,972	18,564	129,350
Colombo ..	..	..	..	..	..	..	2,667	1,126	1,749
Bombay ..	..	..	..	..	..	..	1,446	2,274	1,900
Calcutta ..	..	..	..	..	..	..	482	75	—
Java ..	..	..	..	..	..	..	694	343	2,240
Straits Settlements ..	..	..	..	..	..	..	—	—	75
South Africa ..	..	..	..	..	..	..	900	810	1,500
GRAND TOTALS ..							75,141	23,192	136,814

No apples are sent to London after the end of April, though shipments to other markets continue for some time. The hope for South Australia in connection with this trade is the maintenance of a high standard of quality. South Australian apples have always been favorably received on the London market, and have generally commanded rather better prices than fruit from other parts. The coloring of our apples is fine, while proved varieties cannot be beaten anywhere as regards size or flavor. In the future competition will tend to become keener, and hope lies in satisfying buyers that a uniformly good commodity can be obtained from the Central State. There is a general agreement that the industry is a profitable one, and one of our best orchardists is of opinion that from 10 to 12 acres of good land planted with suitable varieties of apples well looked after will afford a decent living for any industrious man.

Among the Orange Groves.

South Australia possesses some of the finest orange groves in Australia. Those at Renmark are dealt with elsewhere, but orange and lemon culture are not confined to the irrigation colony on the banks of the River Murray. Some of the most productive groves are within a few miles of the city. The gardens in the valley of the Torrens within a radius of 10 miles of Adelaide appeal to visitors from over the seas, who never fail to be impressed with the grandeur of the scene and the practical demonstration supplied of the progress of intense culture in South Australia. Deep, ferruginous soil, absolutely free of extraneous vegetation, and so soft that you sink almost to your boot tops; healthy, vigorous trees, bending beneath



View in an Orange Orchard.

[Govt. Photo.]

their rich load; clusters of yellow fruit—all this tells a tale of scientific attention. Admittedly there is money in orange cultivation for those who understand it, and a good many understand it. There are localities in South Australia which embrace ideal conditions for the industry, and the favored spots are being taken up with avidity. For years planting has been going on apace, and when all the young trees have come into bearing the harvesting of the crop will be a much bigger business than at present, although progress has been marked and consistent. Growers of citrus fruits have been systematically digging up vines and other trees for the purpose of devoting the land to what they believe to be the more profitable undertaking of orange growing. South Australian oranges have found great favor with the Australian consumer, and to the foreign buyer many thousands of miles across the water they are an indescribable

delicacy. An English report, referring to a shipment from Australia, stated—"The pick of the oranges from your end of the world were some magnificent 'navels' from South Australia. These created quite a stir in the trade, for the fruit were so large that in some of the cases there were only 72 oranges all told. These sold at about 18s. a case on the average, and 3s. a dozen for oranges wholesale is quite a phenomenal price. Without doubt the South Australian navels are the finest oranges ever put on Covent Garden market, and though retailers cannot afford to sell them at less than 4s. or 5s. a dozen, it is very certain that fruit of such quality will always command a high price. The South Australian navels are not only fine fruit to look at, but splendid eating. The only fault one can find with them is that the dominance of juice in them renders it undesirable to attack one without arming yourself with a bib, or some such protection for your clothes." For several years shipments of the golden fruit—small, certainly, but typical—were made to the London market, and the fact that buyers there are ever asking for more is unmistakable evidence of satisfaction with the article. In 1897 a few thousand cases were sent to the old country, but in the following year, owing to a short crop, only about 500 cases were dispatched. Then in 1899, when the trees brought forth more fruit, nearly treble that quantity left these shores. The oranges which were shipped to the depot averaged 14s. 2d. a case, but this consignment was by no means a first-class one. Much of the fruit had shrivelled, and the grading was faulty. Since then shipments have been spasmodic, but official reports from the world's metropolis have consistently called attention to the spirited demand which exists for oranges of the best quality, provided they are landed in London between August and the end of the year.

Australian growers tested the English market about 12 years ago, and found it highly favorable to the development of an export business. A trial shipment of 1,740 cases of oranges was forwarded from Sydney, and the prices realised ranged from 23s. to 13s. 3d., or an average of 13s. 8d. a case. After the payment of expenses the returns showed a net profit of close on £134. As this was an experimental consignment, the charges were heavy. As yet South Australia is not a large contributor to oversea markets, but exports are assuming appreciable dimensions. If landed in London between the months mentioned above thousands of cases of Australian oranges would be absorbed, because during that period consignments from other countries, such as Jamaica, Florida, and California, are not forthcoming. One authority estimates that even if 5,000 or 6,000 cases were sent from these ports for several months the London market would not be supplied, to say nothing of provincial requirements.

The South Australian industry, however, is making splendid progress, and it is not to be doubted that in two or three years' time markets will have to be discovered for our surplus fruit. In 1895 there were only 73,000 orange trees in South Australian soil; at present there are nearly 162,000 trees. When all these have attained maturity thousands of cases of this luscious fruit will be available for foreign consumption. The development of orange cultivation can be gauged from the following figures, which deal with the number of trees planted and the annual yield:—

Year.	Trees.	Cases.	Year.	Trees.	Cases.
1895-6	73,365	43,817	1902-3	127,762	62,814
1896-7	99,098	42,705	1903-4	141,856	97,717
1897-8	104,612	46,469	1904-5	151,593	103,893
1898-9	106,674	27,520	1905-6	164,942	130,171
1900-1	109,480	40,073	1906-7	165,230	143,261
1901-2	117,452	58,366			

Lemon Culture. Lemon trees thrive well in almost any part of the State, and considerable attention is devoted to the growing of lemons. The official statistics give the number of trees in 1907 at 76,500, producing 49,230 cases. The manufacture of candied lemon-peel is an established industry, and, with the prospect of a growing surplus, efforts are being made to cure lemons as is done in Sicily, and also for making citric and oil of lemon. Some idea of the growth of lemon cultivation may be gleaned from the attached particulars :—

Year.	Trees.	Cases.	Year.	Trees.	Cases.
1897-8	54,124	9,775	1902-3	67,557	27,057
1898-9	63,654	6,860	1903-4	67,882	40,315
1899-1900	63,838	13,975	1904-5	69,510	37,720
1900-1	61,330	17,548	1905-6	75,982	48,990
1901-2	65,696	27,045	1906-7	76,500	49,230

Currants and Raisins. Another industry closely connected with viticulture and fruit-growing is the cultivation of the Zante currant and grapes suitable for raisins. The practice of ringing the currant vine is now largely practised throughout South Australia, with gratifying results. Fifteen years ago some 36 tons was the total production of raisins, whilst last year over 800 tons of the local article were put on the market. In 1888 43 tons of currants were produced, and in 1906-7 1,164 tons. The business is rapidly expanding, and the quality is superior to the imported article. Professor Perkins writes—"Currant-growers have not as yet to look for an outside market; it will, in fact, be many years ere we succeed in supplying even the Commonwealth's requirements. If we admit that the Commonwealth, with its rising population, is in a position to absorb 6,000 tons annually, and assume that the average yield of currants is not likely to exceed half a ton per acre, even an area of 12,000 acres under Zante currants would not unduly congest the local market. We are far yet from the possible 12,000 acres. Currant-growing can be confidently recommended to those who have taste for the kind of work it involves. I know of no more profitable method of utilising good land." The supply of the locally-dried raisins and currants is insufficient for the demand. The quantities made during 1906-7 were the highest on record. The following figures show the growth of production :—

Year.	Currants.	Raisins.	Year.	Currants.	Raisins.
	Cwts.	Cwts.		Cwts.	Cwts.
1902-3	4,886	11,562	1905-6	19,870	11,919
1903-4	10,406	13,063	1906-7	23,281	16,123
1904-5	16,714	8,697			

A Fruit Colony. The Coonawarra Fruit Colony in the south-eastern portion of the State, was founded about 16 years ago by the late Mr. John Riddoch, who set aside a portion of the Yallum Estate for the experiment. Two thousand acres were surveyed and cut into blocks of 10 acres and upwards. The blocks vary from 10 to 20 acres. Settlers were charged £10 an acre for the land, and were given 10 years in which to pay it, 5 per cent. interest being charged on the balance due. Many of those who took up land have since bought straight out through the medium of the State Bank, enjoying the benefits offered by that institution in the shape of lower interest, and the system of paying off the principal and interest together over an extended period. Anybody visiting Coonawarra at the present time cannot fully appreciate the uphill struggle which most of the colonists have had to make during the last 10 years. Some of the settlers went into the enterprise with insufficient capital, and the period of waiting for the fruit trees to come into bearing

proved too much for them, and the inevitable happened. Those who have been able to remain and work their land are now beginning to reap some reward for their labor and fortitude, and the impression created by a tour of the vineyards and orchards suggests that success is within measurable distance for the industrious husbandmen. There are about 22 families settled at Coonawarra at the present time. In several instances two brothers took up blocks, and the one went out working, earning a little money to keep the pot boiling, while the other brother brought the orchard into full bearing.

Among the varieties of apples grown at Coonawarra are Cleopatra, Cox's Orange Pippin, Five Crown (London Pip), Rome Beauty, Mickajack, Scarlet Nonpareil, Jonathan, Newtown Pip, Stone Pip, and Roakewood. The apples are exported chiefly to London, and the soft fruits are sun-dried. The variety of peaches includes Brigg's Red May, Early Silver, Royal George, Merchant Campbell, Dr. Hogg, and Lady Palmerston. The varieties of apricots are Oullin's Early, Moorpark, and Hemskirk. The plums include Green Gage, French Prune, Felamburg, Prime Pons Seedlings, and Coe's Golden Drop. The Coonawarra Fruit Colony is looking well, the trees and vines having a healthy appearance, and promising good crops.

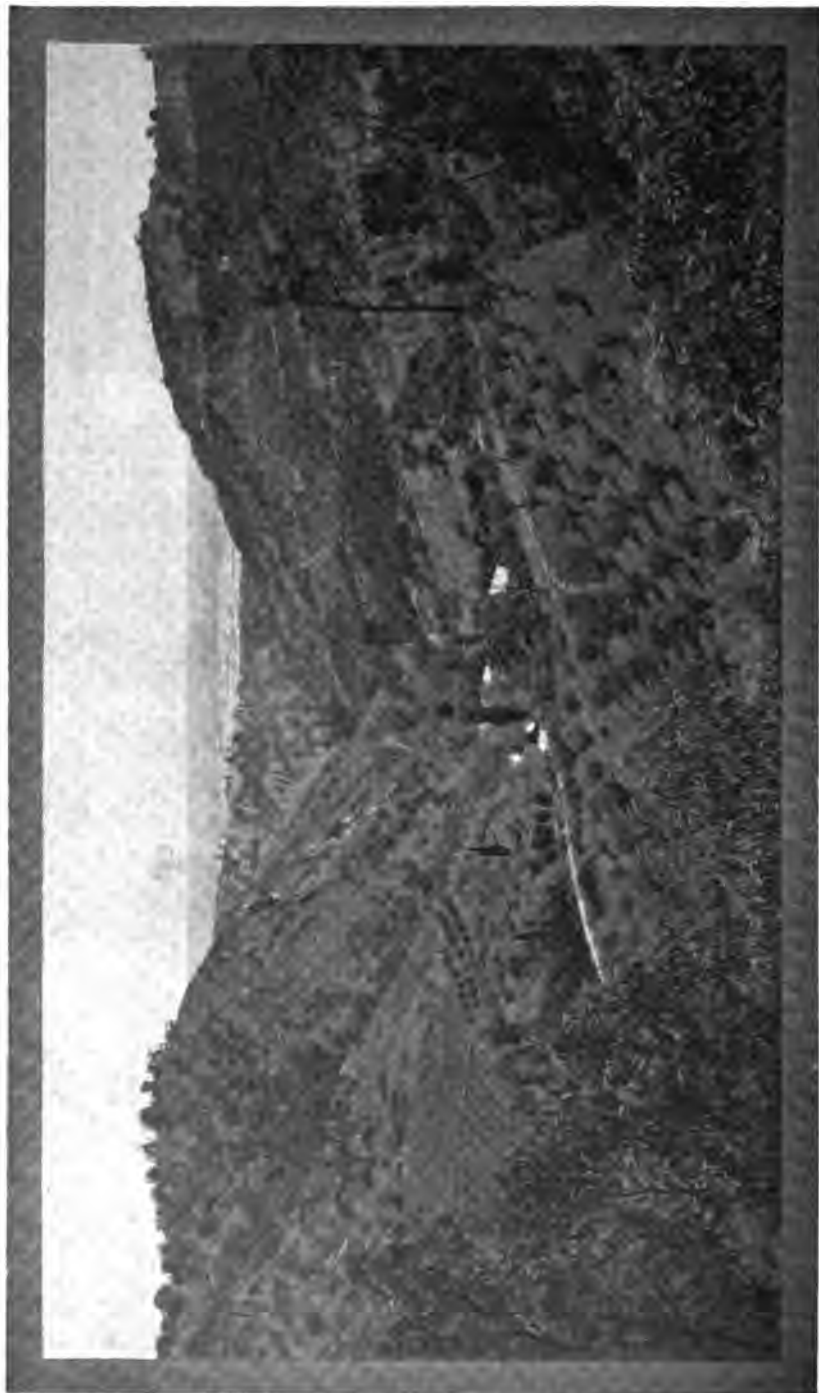
The soil at Coonawarra might be described as being of a chocolate loam in some places and a lighter sandy loam in others, with a limestone formation running throughout the colony. The country in the vicinity of Coonawarra is what some bushmen describe as "pockety," and these little depressions in the land generally represent the richest patches. There is an average rainfall of 27in. during the year, and water is obtainable anywhere at a depth of 12ft. to 15ft. Irrigation is not required, owing to the splendid rainfall and the good supply of water so near to the surface; and this, of course, is a great advantage, and represents a substantial saving. Ever since the fruit colony was founded Mr. Riddoch has given every possible encouragement to the settlers, and to serve as an object lesson he planted about 250 acres with vines and fruit trees on his own estate. Of this area about 139 acres are under vines. All the grapes growing in the settlement are carted to the wine cellar. Settlers are now receiving good prices for these, and there is a tendency to increase the acreage of several of the vineyards.



Large Consignment of Export Apples on the Way to Shipping Port.

[R. H. Ball, Photo.]

ORCHARDS ON THE HILL SLOPES NEAR ADELAIDE.



[Cont. Photo.]
In the Mount Lofty Ranges (within a few miles of the city) there are some thousands of acres of orchards. Apples, pears, cherries, and plums grow to perfection on these hill slopes.



CORNER OF THE WHARF AT THE REMARK IRRIGATION COLONY, SHOWING A BEND IN THE RIVER MURRAY.

(N. S. V.)

Fruit to the Value of nearly £100,000 was Shipped Last Year.

[Chas. P. Scott, Photo.]

CHAPTER XV.

RENMARK IRRIGATION COLONY.

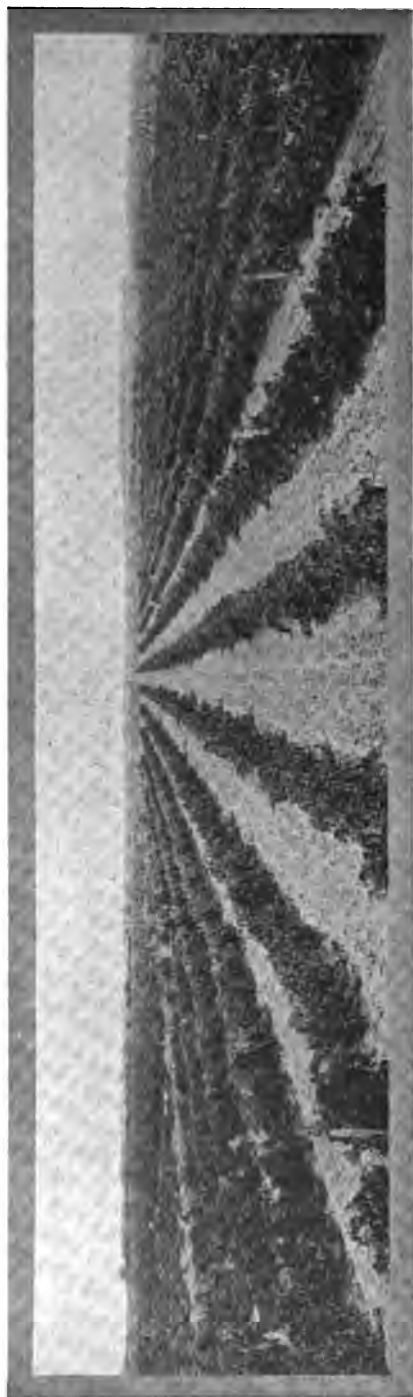
And the wilderness shall put on the glory of a fruitful garden ; the desert shall be made to blossom as the rose ; the dry land shall laugh with gladness ; the valley shall be filled with joy ; the husbandman shall reap the increase and enjoy the fruits of his labor under his his own vine and fig tree.



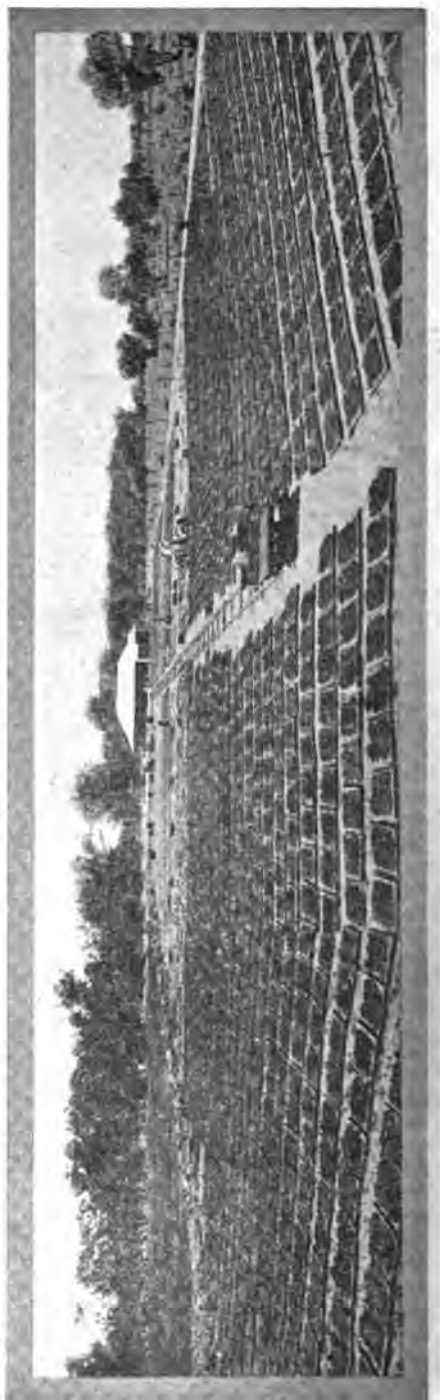
THE Renmark Fruit Colony was wilderness in 1887, and the 20 years that have passed since then have witnessed a wonderful evolution. Renmark was the name given by Chaffey Bros., Limited, to the second irrigation colony which they founded on the Murray ; but, however good that company's designs were, it was not their operations that made Renmark what it is to-day. Rather it was the energy and perseverance of the settlers who held on after Chaffey Bros. retired. Conditions have changed greatly since the agreement between the company and the South Australian Government was signed on February 24th, 1887. The outlying virgin scrub is convincing evidence of what the settlers have done ; but the visitor does not learn, either by the prosperity he sees there or by comparisons with other fruit-growing areas, the extent to which Renmark settlers have had to fight in order to subdue the wilderness and overcome financial and trade difficulties.

Water and Soil. Renmark is situated practically in an elbow of the River Murray. The plan of the settlement is almost in the shape of a fan, with the township at the handle and roads and irrigation channels as ribs. Into these channels—known as main channels—is pumped water from the Murray by a fine piece of machinery on the river bank capable of spouting forth 1,620,000galls. an hour. This is called No. 1 pump, and is inspected by every visitor who wishes to know anything at all about Renmark. There are four others in the settlement, which distribute the water from the long reservoir that No. 1 pump fills into a series of smaller channels, from which, in turn, the settlers take their supplies. The rich, sandy loam to be found in many parts of the settlement is said to be equal to the best Californian lands where irrigation has been profitably conducted for many years. It is easily cultivated, and retains the moisture for a considerable time. In other parts of the settlement the soil is heavier and requires more working, but Muscatel (or Gordo Blanco) vines flourish in it and bear heavy crops. The Murray water contains much organic and inorganic matter and is a useful fertiliser.

How a Desert was Conquered. No one who sees the succession of plantations brought up to a high state of cultivation, the whole reliance of the settlers on the irrigation system, the Fruit Packing Union's busy shed in the fruit season, and the enormous quantity of dried and fresh fruit that is poured into it, can fail to be impressed with the vital importance of a full river to Renmark. More than once the growers—because of the vast diversions made by the upper States and the natural consequence to those situated lower down—have been compelled to resort to the expedient of carting their export fruit for 75 miles along a rough and sandy track to Morgan—the railway terminus. Before even this gigantic labor the hearts of the Renmark growers have not flinched. Only after such trials does the dry land laugh. Only after such superhuman effort is the valley joyful because of its people, who are yearly becoming more resourceful and prosperous. Increasing production and the danger of low rivers are responsible for the emphatic demands for the locking of the river in order to ensure a permanent waterway. The distance between Renmark and Morgan by water is about 180 miles. The river trip—the shorter one from Morgan or the longer one from Murray Bridge—is becoming a popular holiday for the tourist, and



CURRENT AND RAISIN VINEYARD AT RENMARK.



DRYING CURRANTS ON IRRIGATION SETTLEMENT

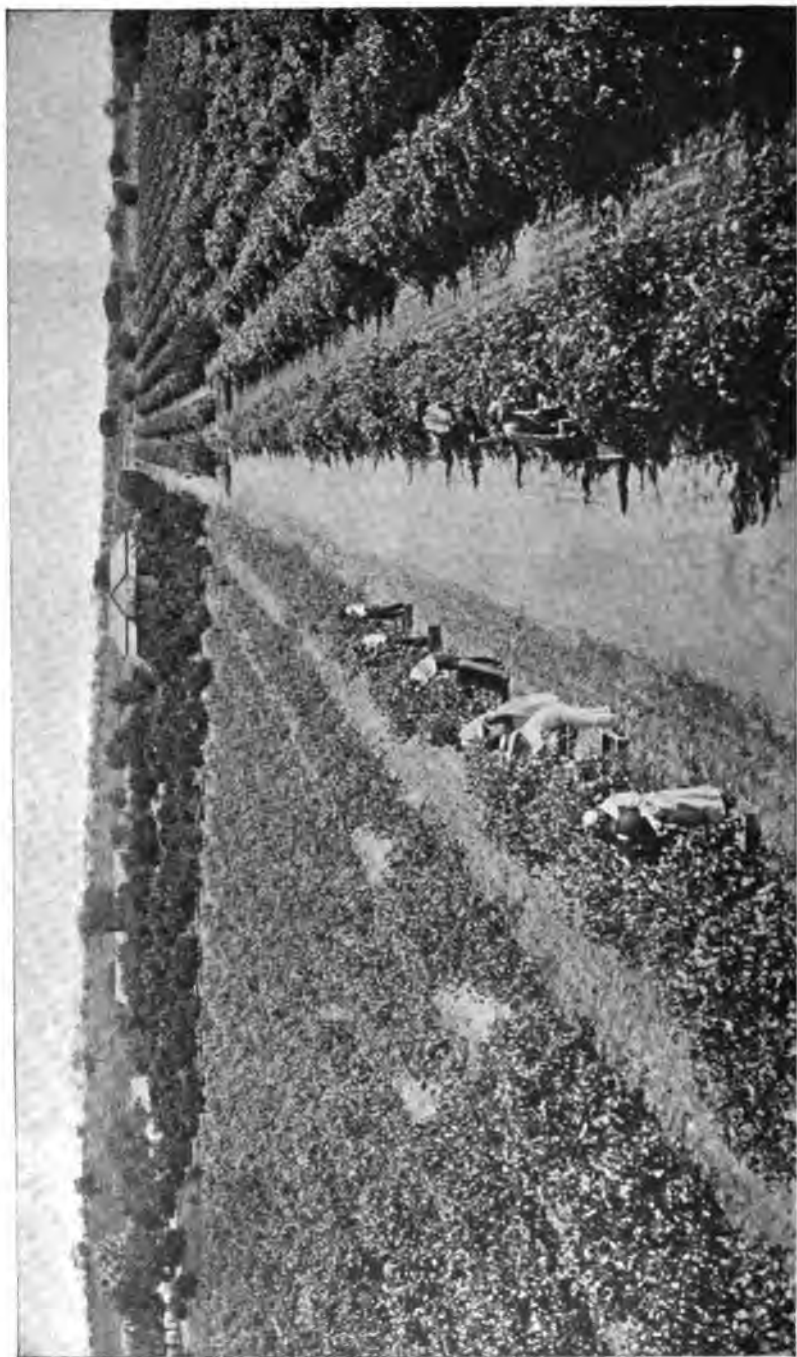
[C. P. Scott, Photo.]

inspires more patriotism, more appreciation of what Australians can do in Australia, than does the most learned study of blue books or the most enthusiastic flight of the imagination. Here along the Murray, the visitor assures himself, fertility and prosperity is a matter only of steady development. When the home-seeker is able to appreciate the fertility of the soil and the fertilising power of water the valley of this great river will represent the addition of another province to South Australia. Astonishing as it may seem, many people have been blind to one of the State's best assets. While men have tried to coax the dry interior to grow wheat and feed stock, these valleys have been left to the rabbits, and the rich Murray water has been allowed to pour its precious contents into the ocean. The foundation of the village settlements and their subsequent partial failure proved in the end a good advertisement for the valley of the Murray. Attention was directed to the problems involved in the artificial application of water to the soil, and from the ashes of the village settlements prosperous settlers rose Phoenix-like and proved that the country was capable of carrying a large population. Renmark suffered severely from the failure of the Chaffey Bros., and for a time the place was regarded as little better than a glorified village settlement; but the settlers had their backs to the wall and they fought hard. Renmark turned the corner several years ago, and the battle has been won, and the prosperous settlement represents South Australia's greatest vested interest in a share of the waters of the River Murray. The visitor to the Irrigation Colony must know all this before he is able to adequately appreciate what the conquest of the desert means to the individual settler and the State.



Irrigation Channel, showing how the Water is Taken to Different Parts of the "Colony."

[J. C. Reinera, Photo.]



GRAPEPICKERS AT WORK IN A RENMARK VINEYARD.

A Conquest and a Contrast.

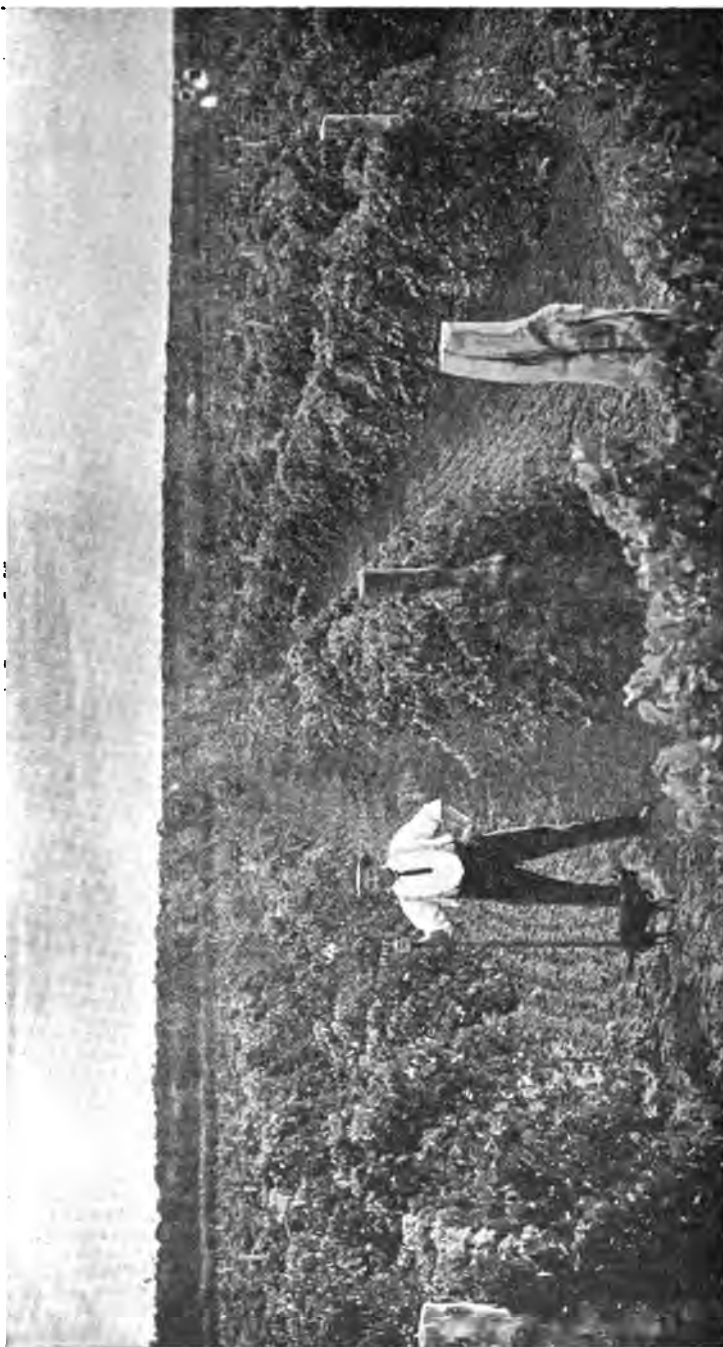
The Irrigation Colony to-day represents a conquest and a contrast. The country in its natural state consisted of low mallee scrub, with a few blades of grass fighting for a miserable existence, and sand shifting from place to place at the caprice of every breeze. The irrigation, the sunshine, and scientific cultivation have shown how fertile that soil really is. Citrus fruits, vines (grape, sultana, currant), apricots, peaches, and pears are the fruits principally grown, though apple, nectarine, and olive trees also bear well. During recent years the apricots and lemons, which were planted in the early years, have been rooted out—in some instances in favor of younger trees of the same sort, but in most cases to be displaced by sultana or currant vines. The reason for this is that from the vines the grower gets his return first. It is not too much to say that the Gordo Blanco raisin has seen Renmark through her troubles. Apricots have grown to a standard market demand and value, as have also peaches, nectarines, and pears. The sultana has of recent years come greatly into favor. The capital cost of planting the sultana exceeds that of the ordinary raisin vine on account of trellising; but the great demand for this dried fruit, which has all the advantages of the ordinary raisin without the ordinary raisin's stones, fully justifies and returns the additional expenditure incurred. Since science has introduced and constantly improved the process of cincturing, and led to the production of quite wonderful crops, many more acres than formerly have been planted with Zante currants. Oranges, such as navels, Malta bloods, Compudas, and mandarin and other varieties, are good property, and the market results have always been good. Although in the past the cultivation of the lemon has not, for market reasons, been completely satisfactory, the future is more hopeful. The lands assessed by the Irrigation Trust, which controls the fruit colony, are valued at over £150,000 and comprise 4,183 acres, and consist of apricots, 344 acres; peaches, 118; oranges, 202; lemons, 83; Muscatel vines, 757; sultanas, 670; currants, 433; olives, 26; pears, 78; nectarines, 4; apples, 4; mixed (various kinds around home-stead), 71; and lucerne, 369. There is also about 1,000 acres paying water rates and classed as unplanted. One boast of which Renmark may well be proud is that there are no fruit diseases in the settlement. Though vine-growing districts in the other States are infested with phylloxera, South Australia is free; and Renmark (the largest grape-producing area in the State) has never known it. How much the care and industry of Renmark has protected South Australia from ravages of phylloxera can never, of course, be calculated. There is a little citrus scale in places, but this, owing to healthy precautions and drastic remedies, has assumed no dangerous proportions. No fruit boxes—whether for export packing or for use in the settlement—are imported.

Local Government.

The local government of Renmark is constituted in what is known as the Irrigation Trust. The members of that body are charged, by Act of Parliament, with the duty of raising and distributing water in the horticultural areas. The expenditure is balanced by a uniform annual rate of £1 per acre, payable on assessed lands whether watered or not. The Trust has district council powers over the horticultural area. During the last year or two the township, which was for a long time under no organised control, has been governed, as are the majority of towns in South Australia, by a district council—the Hamley District Council. The Trust Act of 1893 provided for a loan of £3,000, and that of 1900 for a loan of £16,000. This advance of £19,000 was in order to make good the deficiencies of construction in plant and works as left by Chaffey Bros., Limited.

Quality and Quantity.

Renmark settlers have earned a reputation at home and abroad for the quality of their products. Not only have they established a recognised export trade within Australia, but the fame of Renmark oranges and dried fruits has spread to London, and the quality of Renmark table raisins has enhanced the reputation of London dessert tables. In spite of all obstacles—of which the greatest, after all, has been, and is, the uncertainty of a navigable river—the production of Renmark has improved year after year, and to-day the consumers of Australia to a large extent rely on this irrigation colony for supplies of oranges and dried fruits. The figures



CURRENT VINEYARD AT RENMARK, SHOWING THIRTY MONTHS' GROWTH FROM TIME OF PLANTING

showing the value of annual production tell their own tale. Appended is a table showing the values of Renmark produce exported from the settlement, exclusive of the settlers' own consumption :—

Year.				£	Year.				£
1895	..	..	..	6,878	1902	..	..	..	35,000
1896	..	..	..	7,398	1903	..	..	..	39,250
1897	..	..	..	16,869	1904	..	..	..	40,250
1898	..	..	..	11,968	1905	..	..	..	41,650
1899	—	..	..	18,167	1906	..	..	..	52,000
1900	..	..	—	22,086	1907	..	..	..	78,000
1901	..	..	..	28,167					

Let the visitor, as he reads these figures, take into account the history of the years since 1887, when the first English pioneer fruitgrower marked out his block on uncleared land in Renmark settlement, and say whether these hardy settlers have not shown courage and accomplished a monumental task. The hard times were a severe but a refining test, and to-day there are over 1,100 happy people living there, rejoicing in the prosperity of their "colony," and all the better for the fight against Nature which they won.

New Settlement.

A Bill has been introduced to Parliament providing for the establishment of a second irrigation colony on the Murray, below Renmark, and to create boards for controlling reclaimed swamp lands. The first scheme will deal with about 1,500 acres; but additional settlements are contemplated. The success of Renmark and other irrigation schemes at various points has had the effect of attracting attention to the advantages offered in the valley of the river to home-seekers.



Drying Pears at Renmark,

CHAPTER XVI.

THE WINE INDUSTRY.



OUR wines as a class are undoubtedly superior to the bulk of the European wines, and are, therefore, well able to hold their own on the markets of the world." This is the opinion of Professor Perkins, the Government Viticulturist, and it has been confirmed by leading authorities in Europe, as well as experts in Australia. Viscount des Garets, a champagne-maker of Epernay, France, visited a number of South Australian cellars in July, 1903, and when in Western Australia, on his way back to France, he publicly made the following statements:—"Some of the best wines I have tasted in Australia were those of South Australian production. I am taking several cases of claret, white wines, and brandy to France with me. Before many years the French market will be killed out, and I am quite sure that the export of Australian wine will improve day by day and year by year. Many of the ideas employed by Australian winemakers came from their own heads. These young countries can teach the older places many things, and I have learnt some ideas which I will put into practice in France. My countrymen do not travel enough; there is always something to be learned in the changed conditions of younger countries. I intend to tell them that when I get home, and persuade them to come and see what Australia has to show. Land, land, land everywhere, and out here I see the best means, not to become wealthy, but to live very comfortably and make money. It is a great mistake for the old countries not to send more people out to these places. Land is to be had cheaply, and I think the French farmer comes out on top of the list. I will speak about these things when I get home."

Establishing the Industry.

The high quality of the South Australian product is commanding increased appreciation in foreign markets. There has been a vast amount of prejudice to overcome, and an uphill fight to secure a footing in conservative trade circles, but these difficulties are gradually passing away. The viticultural expert of the State has affirmed that with due care there will be no difficulty in placing wine making in the front rank of the revenue-yielding industries of this State. There is no room for doubt concerning the suitability of South Australian soil and climate to the growth of the vine. There never was from the time that the first vine cuttings were imported. "With the wonderful climate of Australia," wrote Dr. Taylor many years ago, "with its volcanic and other weathered soils full of potash, iron, and other vine food, it would be surprising indeed if Australia were not supplying the world with 'wine that maketh glad the heart of man' long after the worn-out vineyards of the Old World have succumbed to horticultural starvation and entomological ravages." "Experience has shown," says the State Viticultural Expert, "that South Australia is pre-eminently suited to the growth of the vine; and that the manufacture of a good sound wine, capable of holding its own in the world's markets, can readily be obtained from a large portion of our agricultural areas." The vine flourished in South Australia from the first, and wine made with the most primitive appliances was pronounced by connoisseurs to be of excellent quality. Governor MacDonnell, writing to a friend in 1859, said—"I have lately been going through the dozen duplicate samples of wine you sent me from Tanunda, and at least eight of them are excellent. I have been quite surprised at their quality; but I have no doubt this country will be a good wine-producing country. People are setting to work energetically planting vines in all directions, and in four years I have no doubt we shall obtain a tolerable footing in the English market." "With time and care Australia ought to be the vineyard of the world," said Sir Charles Dilke in his "Greater Britain," written after his visit to these lands in 1867. He continued—"The colonial wines are excellent, better indeed than the growths of California, which, however, they resemble in general character. The Albury Hermitage is a better wine than can be bought in Europe." South Australian wines have improved out of all knowledge since Sir Charles

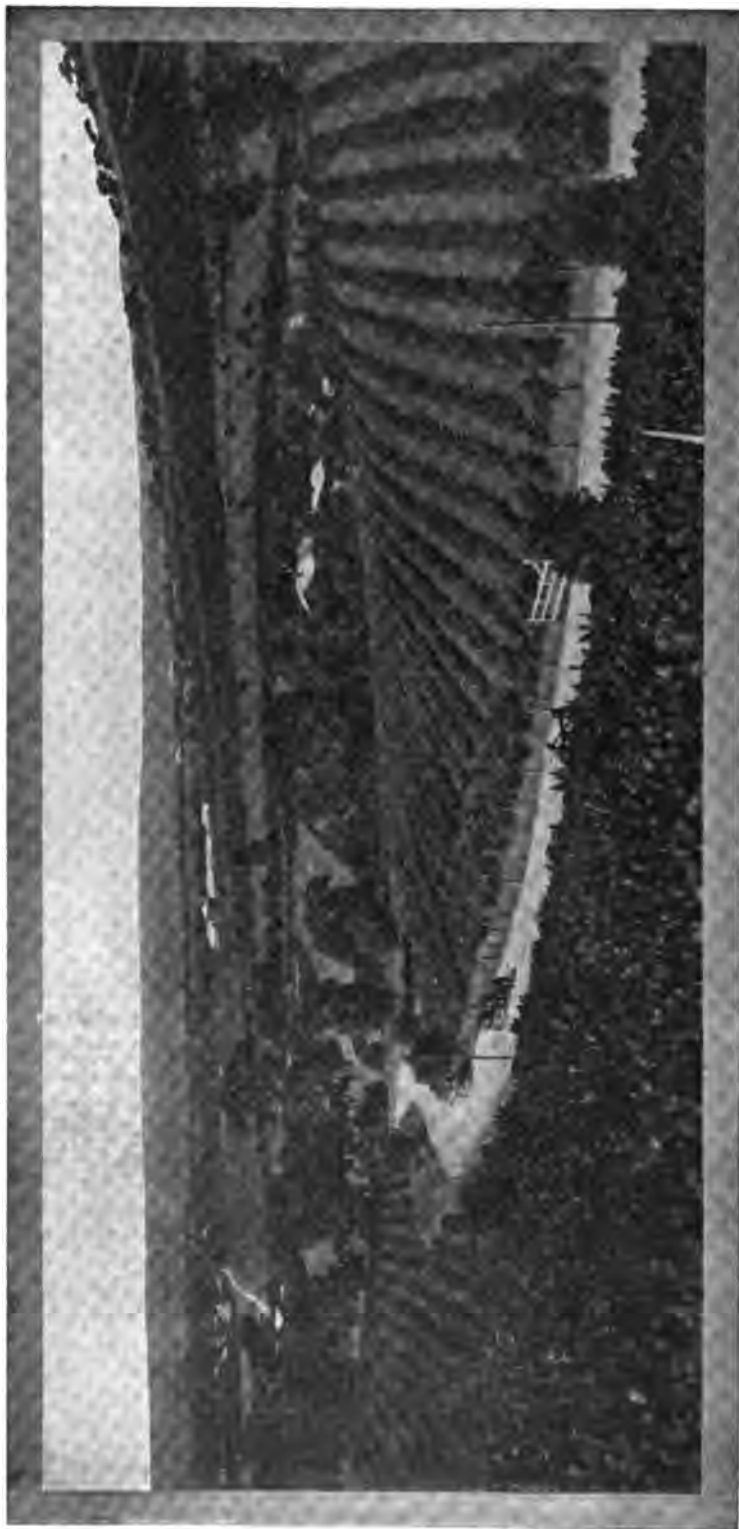


(CH. XVI.)

THE SOURCE OF THE WINE INDUSTRY.

[McGinn, Photo.]

VINEYARDS ON THE HILL SLOPES ABOUT FOUR MILES FROM ADELAIDE.



Govt. Photo.
A number of vineyards and wine-making establishments are situated on the slopes of the Mount Lofty Ranges, within a few miles of the city.

Dilke expressed his views. Mr. P. B. Burgoyne (the London-Australian wine merchant), after a visit to this State, declared—"The wines of South Australia as a whole are a great improvement on those which I tasted in 1893. I find the types exhibit a distinct individuality, and I have tasted wines with an elegance and finish not surpassed by other wine-growing countries. Of this you might indeed be proud." The London *Times*, in 1887, stated that Mr. Richard Bannister, in reporting on the subject in connection with the late Colonial Exhibition under the auspices of the Society of Arts, emphasises the fact that soil and climate in many parts of Australia are eminently suited to certain kinds of grapes. "It depends on the choice of the grapes, on the care with which they are grown and tended, and on their subsequent manipulation and the storing of the wines, whether colonial wines will find permanent and increasing favor among winedrinkers. Recent improvements in South Australia have had such marked beneficial results that there is every hope of a successful future for these wines." During the interval of 16 years since those words were penned, South Australian growers have made great strides, and wines of splendid quality are produced in increasing quantities.

Where South Australia Leads.

According to a report by the Federal Statistician the vineyards of the Commonwealth covered 62,546 acres last year. This is less than in any other year since Federation. The area was greatest in 1904-5, when 65,673 acres was under vines. Of the total area last year 55,922 acres was classed as productive. Of this 23,368 acres was in Victoria and 19,753 acres in South Australia. New South Wales has 7,853 acres, Queensland 1,788 acres, and Western Australia 3,160 acres. Despite the possession of greater acreage, the Victorian vineyards do not produce as much wine as those of South Australia. Last year in Victoria there was produced 2,044,833galls., while in South Australia 2,441,504galls. was made. The total production for the Commonwealth was 5,891,945, most of which was made in Victoria and South Australia. During the last six years wine-production in South Australia has been remarkably constant, showing the stable position occupied by the industry. Starting in 1901 with a production of 2,007,923galls., it gradually increased, until in 1905 it was 2,845,853galls., with a falling off of 400,000galls. last year. In Victoria, on the other hand, the production has varied in a curious fashion. In 1901-2 it was 1,981,475galls. In 1902-3 it was 1,547,188galls., 2,551,150galls. in 1903-4, 1,832,386galls. in 1904-5, 1,726,444galls. in 1905-6, and last year 2,044,833galls. With all this production the imports of wine continue to be high. Last year 43,324galls. of sparkling wine and 71,980galls. of still wine was imported. The exports of wine are far greater than the imports, though they have fallen off in recent years. In 1902 the exports totalled 1,078,914galls., valued at £148,983, while the imports amounted to 181,337galls., valued at £127,769. Last year the exports were only 720,260galls., valued at £97,683. The imports last year were valued at £106,133, so that the balance of value was on the side of the imports.

Praise from Outsiders.

This fact has received striking confirmation from various experts who have come to the State to act as judges at the annual shows. Mr. Browne acted as sole judge at the annual Wine Show held in August, 1903, and at the conclusion of his labors he said that—"In his experience as a judge he had never met wines so universally good and of such high standard. It showed that the growers, or those interested in the trade, thoroughly understood and appreciated their business when they put forward wines of such quality as they had done. It had generally been his experience in years past to be able to pick out four or five wines from the 10 or 12 samples in a class because they stood above the others; but in the present instance the exhibits all ran very close. They would see this when he furnished them with a copy of the points. It had been a very difficult and anxious matter to pick out the best wines. Their full red wines were good, honest wines, and approached the Burgundy. They were good export wines. They had got over the difficulty of producing wines. It was now a question of finding a market for them. He had never come across wines equal to the sweet wines he had judged. They could produce Tokay, Madeira, and Verdelho which would commend themselves anywhere. He had had an interesting conversation with Mr. Fueerhard, the Portuguese seller, who assured him they could produce as good a port wine as any in Oporto. He did not know they wanted anything better than the port wine he had judged." The *Lancet*, the well-known medical journal,

expressing an opinion on South Australian wines submitted in London, wrote—"Australia at a moderate cost is sending us really good wines of the excellent type of those before us. Each year sees a marked improvement in the tone and quality of the vintage."

Growth of the Industry. Natural characteristics of soil and situation of our vineyards must needs always be a vital point of consideration if growers contemplate the production of high-class wines. In South Australia, as in other countries, this potent fact is already making itself felt, and wines of the rarest types are met with in many cellars. The growth of the wine industry has been remarkable, considering the difficulties associated with the business. Some vignerons had a lot to forget in the cultivation of the vine in a new land. All of them had much to learn. The process of education was slow and costly, but most of the problems which troubled the early makers are problems no longer. Present-day cellar-men have a clear course, and when



Grapepickers at Work in a Large Vineyard.

a few difficulties connected with the marketing of the produce in foreign markets shall have been overcome, as they soon will be, the expansion of the industry will be assured. Early history connected with the introduction of the vine to South Australia was so well reviewed by the late Mr. Crompton at a banquet held at McLaren Vale a few years ago, that I cannot do better than summarise the interesting statement made by him. It appears that Sir William McArthur, of New South Wales, to whom Australia was especially indebted for the introduction of the Merino sheep, also imported vines suitable for wine-making. That was the beginning of the well-known Camden vineyards. There was also a very valuable collection of vines made by Mr. Bushby, which was subsequently entrusted to the Sydney Botanic Gardens. There were Mataro, Grenache, and Carignan, and probably nearly all the vines of the South of France, and this collection was large in the number of varieties. Mr. Bushby spared no pains to make it complete. About Perpignan his tracks were to be found years afterwards. It was probably from Mr. Bushby's collection that South Australians obtained the varieties named, as well as the Shiraz. It was known in South Australia that those vines were to be had from Sydney, and cuttings were sent here before 1850, probably to various applicants, notably to Mr. Davenport, at Macclesfield (now Sir Samuel Davenport). In addition to those importations to New

South Wales there were two collections of Spanish vines. From one of these originated the Clarendon vineyard belonging to Mr. Leigh, after whom Leigh Street in Adelaide was named. The collection went to form a vineyard at Marino. In 1866 Mr. Crompton was introduced to the gentleman at St. Mary's, near Cadiz, who selected these cuttings for Mr. John Brown, a name well known to all old colonists, from whom they passed to Sir George Kingston. The introduction of the Zante currant vine is credited to Mr. Bailey, well known as giving his name to Bailey's Garden at Hackney. Various other vines were brought to the State at different times, as, for instance, the white Sauvignon, by Dr. Kelly, the Sultana vine, for raisin-making, which was first grown at the Botanic Garden. To the late Mr. John Reynell, however, is due the credit of having imported cuttings of wine grapes from Sir W. McArthur, and of planting the first vineyard and making the first wine. Reynella did not exist as a township for some years afterwards, but there was a vintage there in 1846—probably the first in South Australia. Cuttings from Mr. Reynell were used in planting Dr. Kelly's vineyard at Trinity, Morphet



General View of Seppeltsfield, South Australia, showing portion of Cellars comprising the Largest Winery in the World. (The cellars at the close of last vintage held over 1,000,000 galls. of wine.)

Vale, and of Mr. Perry; also of some vineyards in the Tanunda district. The varieties planted in the first vineyard at Reynella were the Gouais and Verdeilho, white grapes, two kinds of Pineau, Malbec, and Carbenet grapes, red grapes. That was no mean collection as regarded quality, even judged with the experience of half a century. "It might interest my younger hearers," concluded Mr. Crompton, "to know when passing through the now large acreage of vines at Reynella, to recollect that it was the first vineyard for wine-making in South Australia, and the parent of an industry from which much was now being realised, and from which much more might be confidently expected." South Australian wines have gained a large number of prizes at foreign exhibitions and inter-State wine shows. In 1891, in Tasmania, the awards to South Australian makers were greater in number and value than the combined prizes which went to other States. The Colonial Surgeon, in one of his recent reports, stated—"Colonial wine still continues to be used (in the hospitals), and the experience verifies the remark made in previous reports that, while it costs less, it is superior to the imported article." South Australian wines and brandies are now in general use in the hospitals of Australia, and in many similar institutions in England.

The Force of Figures.

The following table shows the quantity of wine made since 1861 in the years given :—

Year.	Gallons.	Year.	Gallons.
1861.. .. .	182,087	1900.. .. .	1,558,285
1865.. .. .	798,647	1902.. .. .	2,431,563
1870.. .. .	895,795	1903.. .. .	2,573,424
1875.. .. .	648,186	1904.. .. .	2,345,270
1880.. .. .	500,955	1905.. .. .	2,045,458
1884.. .. .	473,535	1906.. .. .	2,655,947
1890.. .. .	1,052,086	1907.. .. .	2,495,434
1895.. .. .	1,578,590	1908.. .. .	2,061,987

The acreage under vines has steadily increased. In 1892 there were 12,314 acres, with 4,030,724 vines in bearing, and 3,146,564 non-producing. During the next 10 years the area had increased to 20,860 acres, the number of productive vines to 9,504,880, and 1,396,531 vines not in bearing, aggregating over 10,000,000 vines. During the succeeding five years there was a substantial expansion of the area under cultivation for vines. The increase in the area has been gradual for some years as the following table will show :—

Year.	Acres.	In Bearing.	Not in Bearing.	Year.	Acres.	In Bearing.	Not in Bearing.
1892	12,314	4,030,724	3,146,564	1902	20,860	9,504,880	1,396,531
1893	15,418	4,206,880	4,545,737	1903	21,692	10,067,139	1,396,531
1897	18,333	6,809,737	2,493,928	1904	22,617	10,380,926	1,853,810
1898	18,761	8,021,070	1,803,367	1905	23,210	10,648,128	1,710,674
1899	19,159	8,814,086	1,355,014	1906	23,603	10,924,209	1,802,237
1900	19,438	9,032,063	1,310,948	1907	22,575	10,599,712	1,523,999
1901	20,168	9,207,935	1,215,908				

The rapid increase in production during the last 10 years has, notwithstanding a substantial advance in exports, compelled winemakers to extend their cellars and carry increasingly heavy stocks. Free trade between the Australian States, as the outcome of Federal Union, has given an impetus to the inter-State wine trade, and South Australia has greatly benefited.

In 1896 the locally grown wine reported in stock was 3,713,381galls.; it is now returned as 4,641,622galls. The wine export increased from 391,233galls. to 737,664galls. in 1907. During recent years there has been a strong local demand, while the export trade has also improved.

The following table shows the wine in stock, the quantities exported, and the value thereof since 1893 :—

Year.	Wine in Stock as on June 30th.	Wine Exported.	Value.	Number of Stills.	Spirits Made.	Duty Paid.
	Gallons.	Gallons.	£			
1893	2,776,664	260,251	47,300	36	109,239	6,410
1894	2,908,320	256,216	49,475	39	76,951	5,832
1895	3,579,605	343,405	58,826	36	98,718	7,096
1896	3,713,381	391,233	73,316	38	147,093	12,628
1897	4,371,951	513,714	82,553	38	128,376	11,346
1898	3,717,008	514,065	78,381	37	149,488	11,195
1899	3,896,307	496,610	77,773	38	94,045	12,930
1900	3,521,637	476,646	78,153	40	123,302	13,807
1901	4,915,636	595,853	92,418	57	122,214	15,897
1902	5,027,759	846,691	124,916	63	172,728	22,480
1903	5,535,694	561,830	94,660	—	201,407	28,221
1904	5,300,000	686,159	107,573	—	282,929	32,136
1905	5,304,236	727,746	107,792	—	306,314	31,594
1906	5,800,498	562,819	99,247	—	335,412	38,083
1907	5,392,245	737,664	120,393	—	398,300	60,318
1908	4,641,622	—	—	—	—	—

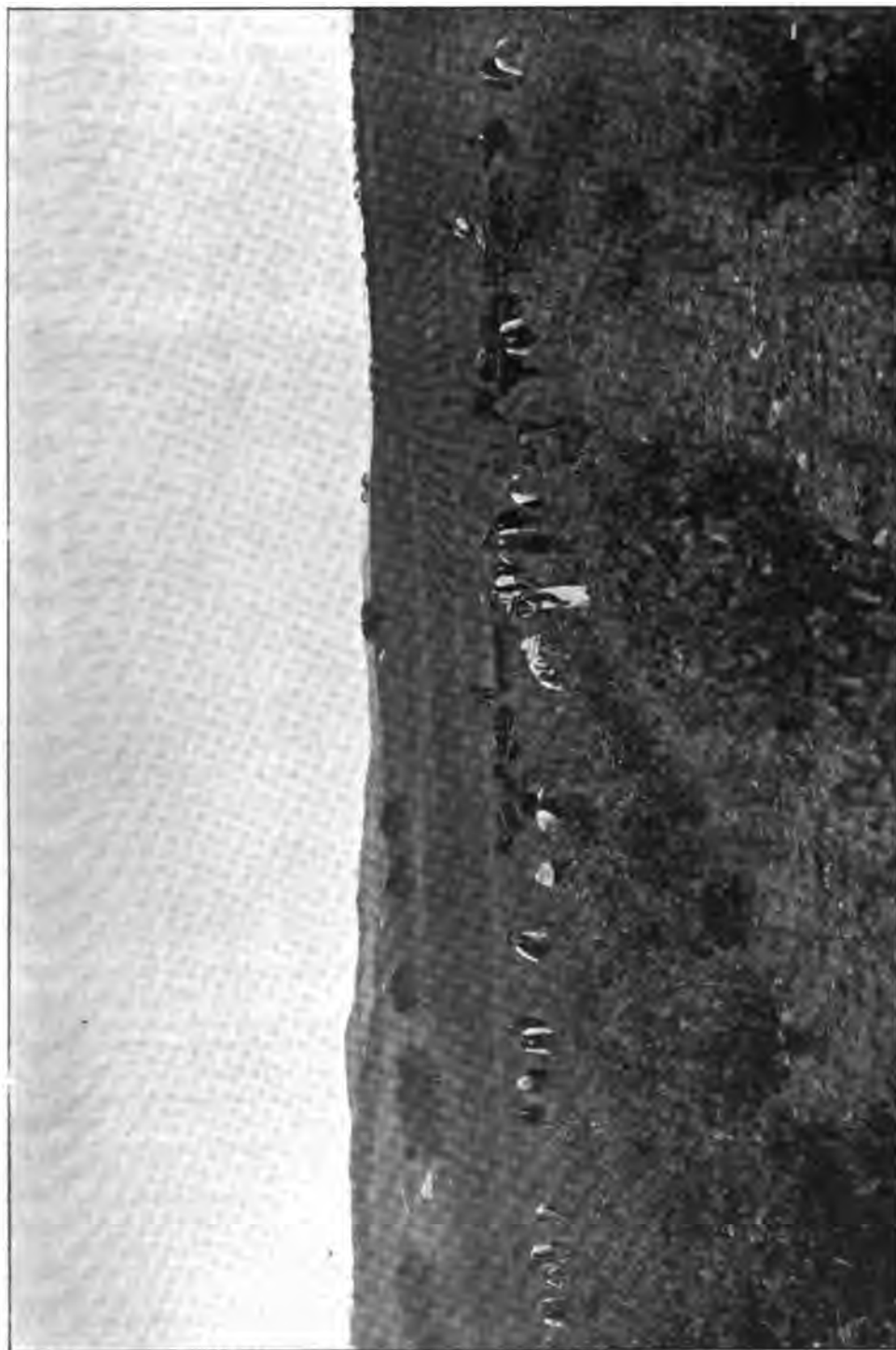
Scientific Methods of Manufacture.

Australia is admirably fitted to grow large quantities of excellent wholesome wine. The growers in that country have gone to great expense, and have manifested much enterprise in obtaining the best varieties of grapes, and the most improved plant and appliances, for producing wine of a high quality. They have also induced French experts to emigrate to Australia to teach the best methods of dealing with the vine, the grape, and the wine, at every stage, from the planting to the bottling of the finished product. One point, which everyone connected with the Australian wine trade is insistent upon is that the wine consists of the pure juice of the grape without any admixture or "faking," such as have recently been shown to take place in connection with some Continental wines. The pioneer vigneron in South Australia employed the same primitive methods of extracting the juice from the grape as those followed by the Egyptians in the days of Pharaohs. All kinds of "presses" were requisitioned in the "early days," from the naked feet of young Australians to the home-made hand crusher. South Australian vignerons have had to pass through a long and trying



Adelaide Wine Cellars, belonging to Thos. Hardy & Sons, Limited, Proprietors of Tintara Vineyards.

course of evolution before they reached the position which at this moment marks them as ranking amongst the most enlightened winemakers of the day. Few countries have been so alert to the requirements which different climatic conditions have brought along with them. Not only are our wineries models of cleanliness and perfect fermenting-houses in every sense of the word, fitted up as they are with the most approved cooling systems, but they have been almost universally built to take advantage of the slope of the land which enables the pulp or liquid to gravitate from the top end of the cellars to the terraces lower down the hill. South Australians may pride themselves with having originated and perfected a scheme for treating enormous bulks of grapes, which is not only being copied by the other wine-growing States of the Commonwealth, but has attracted the attention of interested visitors from many of the largest wine-growing centres of the world. Viscount des Garets, after a visit to one of these establishments, expressed himself in terms of the highest encomiums at the practical principles which have been introduced to minimise the handling of the grapes when they have once passed the stemmers and crushing mills. New machines of the latest patterns are continually taking



THE TIME OF VINTAGE.

the place of older types, and powerful hydraulic and continuous presses are used for treating the "marc" at the final stage. Spontaneous fermentation, which is still almost entirely relied on in old and conservative countries, is fast being replaced by more scientific methods. Cultivated levures are introduced into the "must," and, although it cannot be claimed that a superior wine may be produced from an inferior grape, it has nevertheless been proved that when a ferment of energetic qualities has gained the upper hand it suppresses the numerous undesirable germs which would otherwise develop to the detriment of the fermented product. Every country that desires to attract the permanent attention of those interested in the industry must necessarily produce larger quantities of a uniform class of wine whose quality may be thoroughly relied upon. Our vignerons recognise all this, and they know that it is useless for Australia to endeavor to create a market for herself by imitating the thin, almost unsaleable wines of France, or the more acrid types of the Rhenish districts, while her generous climate is so favorable for the production of so rich and full-bodied a wine which is already gaining the serious consideration of the English merchants.

Vineyards Free from Disease.

There are two features in connection with the wine industry to which vignerons attach great importance. One is the entire absence of disease in any of the vineyards, and the other is that with the removal of the border Custom House on the establishment of Federation a large inter-State market was at once thrown open. A few years ago a Phylloxera Board was established under Act of Parliament, and complete machinery was created for preventing the introduction of the pest so much dreaded by the vinegrower. Mr. Henry Lowcay, an expert of considerable experience in other countries, was appointed inspector under the Board, and he has made two complete inspections of every vineyard in South Australia, over two years having been occupied in this critical examination. Mr. Lowcay, in his official report, has been able to declare that not only is there not the slightest trace of phylloxera in South Australia, but that the vineyards are completely free from disease of any kind.

Tribute by a Visitor:

Mr. Frank T. Bullen, the well-known author and lecturer, after a visit to the vineyard districts near Adelaide, gave the following striking testimony:—"Each suburb that is passed on the upward journey is neat and well groomed, and, moreover, a characteristic feature of this favored land looks as if the inhabitants had come to stay. There is no 'I'm but a stranger here' appearance about the snug houses and well-kept lots, while the fruit trees suggest a veritable garden of the Lord. All the home fruits grow here in rich profusion side by side with oranges, lemons, and grapes, grapes, grapes, until you cease to wonder how it is that the Adelaide hawkers can afford to stand all day selling grapes that are simply perfection for size, flavor, and variety at a uniform rate of a penny a pound. But gladly as I always welcome the view of an orchard or a vineyard, I confess that my attention was always more quickly arrested by the fat, black, level land in the valleys whereon were growing in most lavish profusion all the vegetables that we love at home—peas and beans, onions and potatoes, parsnip and beet, side by side with luxuriant tomatoes, huge melons, and many other tasty agricultural products of sub-tropical countries. A gentle land, where frost is unknown, and where the temperature is so kindly that temperate and sub-tropical fruits and vegetables grow side by side; the only trouble being to find sufficient markets for the abounding crops, garnered with the minimum of labor. But what, I think, impresses all visitors to this favored spot more than anything else are the vineyards, especially if he be conversant with Continental grape-growing districts. This strong, red soil, bearing evidences of abundance of iron on every hand, seems to be the natural home of the grape, and to be free in an amazing degree from those insect pests which have made the lot of the French and Italian vignerons such a weary one. Every variety of grape seems to flourish here in such wonderful luxuriance and fecundity, and withal in such healthfulness of foliage and fruit, that the eye wearies of admiring their prolific masses. Quite unintentionally it so happened that I was invited to go and visit first one of the youngest of the vineyards and its 'winery,' as it is called, in company with two gentlemen, proprietor and editor respectively of a great newspaper out here. And I must confess that I was amazed at everything I saw. The wagon-loads of tiny but rich-tasting, luscious grapes coming in from the adjacent vineyards, where they were being picked by a merry troop of boys and girls; the ceaseless elevator, upon whose revolving shelves a burly, silent man hurled huge forkloads of

grapes, the drum above in which those same grapes were separated from their stalks and crushed at the same time, the juice flowing one way and the stalks another, and the crushed skins another, together with other swift processes, were mightily interesting, especially as contrasted with the old crude methods of the Continent, with their maximum of dirt. I thought of Macaulay's—

This year the must shall foam
'Neath the white feet of laughing girls.

and felt that this method was infinitely preferable. Then down below, to where the great square tanks, full of juice, were bubbling and boiling in the throes of fermentation, where I elicited information about the hastening of that wonderful process by the addition of special cultures *a la Pasteur*—for your Australian winegrower is nothing if not scientific. Here is a flood of claret, here of Sauvignon grape, here of Muscat, here again of claret; but all busy, and none allowed to waste an unnecessary moment in the preliminary processes, however long they might have to lie and mature afterwards. And I was especially interested to see how the tint of the grapes



Interior View of Large Wine Cellars.

was reproduced in the wine, so that a very slight acquaintance with wines and a keen eye for color would be sufficient to name the particular grape from which any given backful had been crushed.

Spotless Cellars. "There was an air of absolute purity, of precise cleanliness everywhere which was exceedingly pleasant to notice; but there was also a curious solemnity, a brooding over everything that was most impressive. Even on the top floor, where the machinery was in evidence, there was only a subdued hum, all being driven by an English-made petrol engine, which I was proudly informed had run for four or five years—that is, ever since it was put in—without any attention beyond an occasional wipe and the necessary feeding with petrol, it having never once given the slightest trouble. But as we descended into the vast cellars amid vats and tuns of maturing wine, varying in their contents from 500galls. to 2,500galls., the silence became positively oppressive, and I found myself involuntarily speaking in a whisper, as if in some stately fane. Again, anything more unlike the wine cellars of the Old World that I have seen could not possibly be imagined. There cobwebs, mildew, fungi, and a damp, earthy smell, as of the tomb; here, not a spot of dirt or speck of dust to be seen anywhere, as if scores of busy housemaids went

all over the place every morning, which, of course, could not be the case. There were very few men about; labor is costly here, and, consequently, every labor-saving appliance that can be devised is employed. But I was glad to learn that all the bottles I saw being filled were of Australian, not Belgian or German make; that these people had too much patriotism to let a home industry be filched from them by free importers who would take nothing in return. And certainly these hocks and clarets and ports looked very beautiful in their neat bottles, with attractive labels, especially when I remembered—having watched the whole process so far as the human eye can follow it—that their contents were all absolutely the pure juice of the grape, without any extraneous admixture whatever; and for that I will not claim any special virtue on the part of the vigneron, only pointing out that the pure article is cheaper to make than any adulterated one would be.

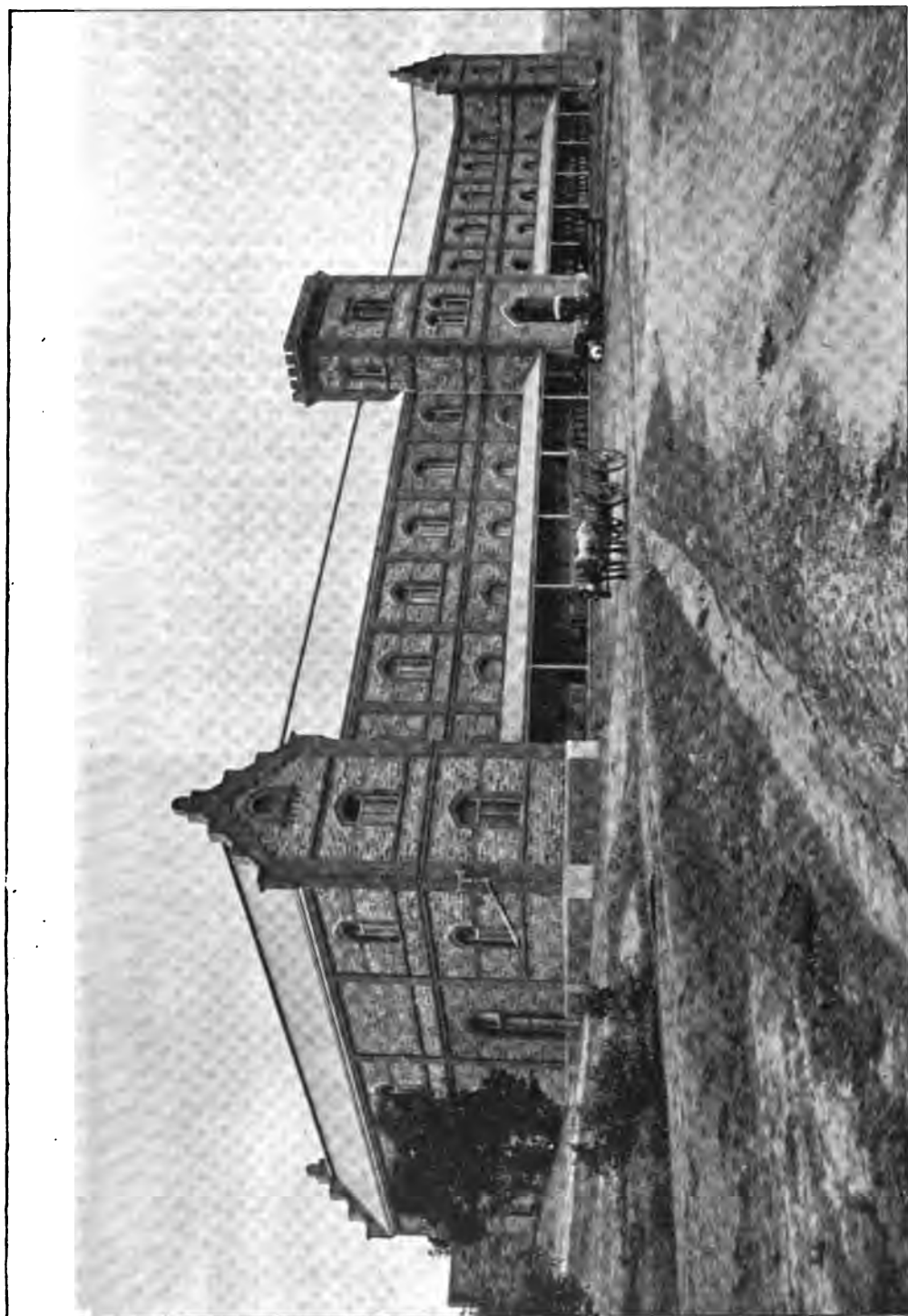
Purity and Prestige.

"We then went into the stillhouse, where an absolutely pure brandy was being distilled, and I remembered vividly the outcry at home, where it was said to be impossible to get pure brandy. I am assured that it does not pay the Australian winegrower to sophisticate his brandy. That it is infinitely superior to any foreign brandy on the market at double the price I can also well believe, and, as far as a novice's taste may decide, it certainly is more palatable than any French brandy I have ever tasted at any price. Why, then, is it not in its rightful place at home? Brandy is not a drunkard's drink; it is largely medicinal, and it is essential that it should be pure. And I believe if the people who now pay large sums for inferior foreign brandy would only try the pure product of the Australian grape they would never purchase any other. The wine is said to be too strong, too alcoholic, and I can easily believe that to be the case; but so far as the brandy goes it can only be described as the best obtainable, because absolutely pure. I came away from the vineyard with a feeling of great pleasure, on the one hand that I had been privileged to witness so beautiful a process, and of intense sadness on the other that these splendid natural products of our own loyal kin should still be in the struggling stage, should still have to fight for a bare existence against far inferior Continental wines that have nothing to recommend them but the prestige of their name."

The wine cellars at Coonawarra are an adjunct of the fruit colony, and they represent a profitable outlet for a portion of the produce raised by the settlers. Mr. McBain, who was for some time Assistant Viticulturist at the Roseworthy College, is manager of the cellars, and his experience has enabled him to bring the accommodation quite up to date and supply it with all necessary appliances. Coonawarra has won a high reputation in the local as well as on the London market. In connection with the cellars is an up-to-date distillery, where any surplus wine is converted into wine or rectified spirit, for both of which there is a ready sale.

The Brandy Industry.

One of the most remarkable features in connection with the wine industry has been the increase in the production of brandy. The superior quality of the brandy produced in South Australia from the pure juice of the grape has secured the approval of the medical faculty at home and abroad. Considerable capital has been invested in the industry and the latest appliances brought into use. The Viticultural Expert of Western Australia (Mr. Despeissis, M.R.A.C.), in his official handbook, referring to Australian brandy, says—"Three or four of the leading brandy manufacturing firms of the Eastern States have lifted it up, in the face of unreasonable prejudice, to the level of the best brands of French brandy. The trade is a rapidly increasing and profitable one, and the Army Commissariat, recognising its merits, now puts it on a par on its tender list with the best brands of French cognac placed on the market." The distilling of brandy is in so many ways closely allied to the wine industry that it is almost essential that the two should be taken together. Whatever advancement has been made in the latter branch has also had the effect of improving the quality of the former. There is no doubt that spirit-drinking is as much susceptible to the fashion of the day as the consumption of any other liquor, and it cannot be denied that the tendency in Australia to-day is towards the consumption of distillations of the malted liquors. There is a steady increase in the production of pure Australian brandies which are only able to create a demand for themselves at the expense of the imported French article. It is not unlikely that the purity of the spirit has greatly assisted to open up this branch of the industry, and if its high standard and quality are maintained



The Chateau Tanunda, where Chateau Tanunda Brandy is distilled. Storage capacity, 1,200,000 gallons. The cellars are fitted with all modern conveniences.

there is no doubt that it will in time completely drive the imported article from its shores. The distinctive character and flavor which distinguishes a pure grape brandy from any other spirit is due to the presence of delicate æthers and essential oils which are passed over with the spirit during the process of distillation. Brandies of the highest qualities are usually distilled on the old pot-still principle, but care has to be exercised to divide the distillate in such a manner that only the higher grade spirits are retained for consumption. As the young spirit passes from the still it is conveyed into the bonded warehouses, where, under the supervision of the Government official, it is allowed to mature until during the course of time the fragrance of the ætheric and other æthers is developed and the spirit itself becomes mellow. So highly are Australian brandies esteemed for their purity that they are used in almost every hospital throughout the Commonwealth, and medical men are loud in their praises as to the stimulating qualities of the spirit. Distilleries began to spring up during the earliest period of the settlement of South Australia, and no doubt many a quiet out-of-the-way place that was not within the direct knowledge of the suspecting excise man drove a thriving trade by avoiding the Customs duties. It is only natural that much crude spirit in this manner found its way into consumption; for the doubtful method under which distillation was conducted, combined with a ready sale, rarely ever permitted the spirit so produced to be aged until its coarser properties were reduced. The introduction of stricter laws, a more settled manner of life, and a refinement of the palate of the drinking public, however, altered this lax state of affairs. The production also grew larger than the consumption, and thus the demand for aged brandies soon forced the distillers to adopt more rational methods for carrying on this important industry. Apart from such spirit that is consumed as brandy pure and simple, there are thousands of gallons that are annually used in the manufacture of sweet wines such as ports and sherries. This has necessitated the erection of large distilleries, which are fitted up with the usual elaborate and complicated plant for the distillation of high-grade rectified spirit. Each distiller favors such methods as he thinks most applicable to his own particular case, and, although stills of every description have been introduced from England as well as the Continent, the principle on which they are all based relies on the fact of different degrees of caloric being requisite to convert different liquids into vapor. Such, then, is the development that has taken place during the course of time, and, although it is more often considered but a branch of the wine industry itself, it is nevertheless of sufficient importance as to be a great source of revenue to the State.



Corner of Bottling Department in the Largest Winery in the World—Seppelt & Sons, Limited, Seppeltsfield, South Australia.



**A SPRING SCENE: ALMOND TREES IN BLOSSOM ALONG FOOTHILLS.
Adelaide in the Distance.**

(CH. XVII.)

CHAPTER XVII.

POULTRY RAISING.

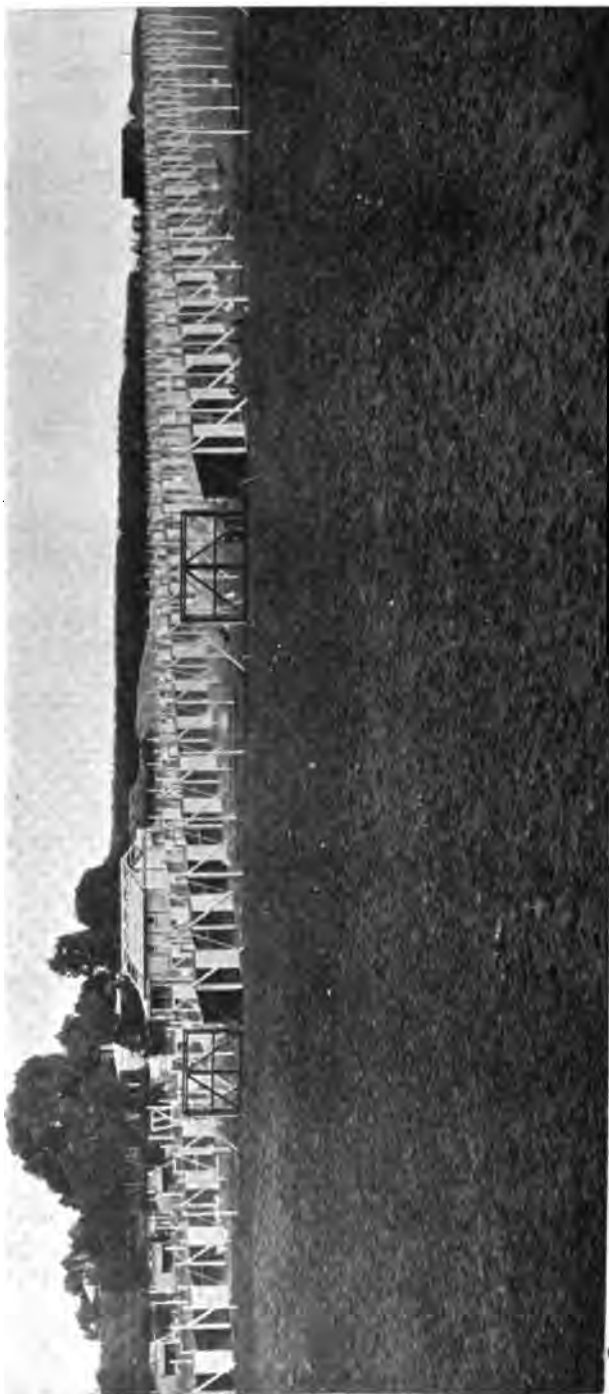
THERE is probably no other country where poultry thrive as they do in South Australia. Whether in the cool hills districts, the South-East, where colder conditions prevail, or the warm northern areas, the birds do excellently, and constitute a source of profit to the farmer or the fancier. This is particularly true of the drier regions of the State, in the North and on the Murray Flats. There is no better egg-producing country in Australia than the limestone regions in the Valley of the Murray. Both the climate and the soil are perfect for live stock of all descriptions, and poultry do extremely well. Weather conditions are such that the fowls need shelter for practically only a few weeks of the winter season, and there is unlimited scope for flesh development and egg-producing qualities. Disease is practically unknown in the poultry yards of South Australia. The reclamation of swamp lands is a work which is being vigorously pursued, and, with the growth of fodders, especially lucerne, the possibilities of cheap production on a large scale are almost unlimited. Green feed grows luxuriously; lucerne is cultivated with remarkable ease and at trifling cost. Ducks grown on it will give a greater profit than any other stock. Fowls and turkeys can be advantageously fed with from 30 to 40 per cent. of lucerne, which promotes health and stimulates production, at a considerable saving compared with ordinary methods of feeding.

Money in Fowls. A few figures will illustrate the development that has already taken place in the industry, and will serve to indicate that there is "money in fowls":—

EXPORT OF EGGS.									
Year.				£	Year.				£
1895	..	..	..	45,000	1900	..	..	..	73,679
1897	..	..	..	50,034	1901	..	..	..	73,520
1898	..	..	..	55,719	1907	..	..	..	106,800
1899	..	..	..	64,932					

EXPORT OF POULTRY.									
Year.				£	Year.				£
1898	..	..	..	2,002	1901	..	..	..	2,564
1899	..	..	..	2,783	1907	..	..	..	20,000
1900	..	..	..	3,391					

The statistics fluctuate, but that is due to the hitherto spasmodic and unorganised character of the export business. The first shipment of eggs in bulk was made in 1906, and it proved two significant things—that South Australian eggs can be landed in England in a perfectly fresh condition, and that there is a splendid market for them with a satisfactory profit. The expert says the net price in the over-sea market represents the local minimum. He is sanguine that the ruling minimum of 6d. will, by this means, be raised to 7½d. or 8d. Each penny per dozen on eggs exported will represent about £20,000 additional revenue yearly to our producers, and, including local consumption, at least £50,000. Production is increasing rapidly, and on this basis we may, in a few years, expect the figures to reach £200,000 and more, as our annual receipt for eggs exported from the State. In 1907 two shipments of eggs totaling 40,000doz. were made. These landed in excellent condition and at an appreciable profit to the senders. Special stress was laid by the English newspapers on the splendid quality of the infertile eggs, the export of which has been consistently advocated by the expert. Last year the inter-State market was exceptionally active, and large consignments to other parts of the Commonwealth were made, further indicating the popularity of the article. Everything points to an expanding trade and enhanced returns for poultry-raisers. Cold storage accommodation in Adelaide is being increased to a great extent, so that no fear may be entertained by breeders regarding the preservation of their produce.



Egg-laying Competition at Roseworthy Agricultural College: General View of the Yards.

Exporting Frozen Poultry.

Until recent years no organised attempt had been made to ship poultry through the Produce Depot to London and South Africa. Small lots sent from 1895 to 1905 met with varying success. It was not until 1906 that an effort was put forth to establish the industry on sound business lines. The Government sent its expert into the country, and a comprehensive canvas was made of the poultry centres. Instructions to breeders were circulated throughout the State, and as a further inducement a table poultry exhibit—said to have been the biggest and most complete in the world—was organised in connection with the Royal Agricultural Society's Autumn Show of that year. The experiment was a pronounced success, and gave a desired flip to the trade. Over 400 birds of excellent quality were shown and subsequently exported to London, the total shipments for the season aggregating 670 birds. Satisfactory prices were realised, and the general get-up of the show consign-



Poultry Yards at Mr. G. G. Legoe's, Unley Park, near Adelaide.

[W. S. Smith, Photo.]

ment won the unanimous approval of buyers. Stimulated by this success, shippers began to extend their operations, and the 1908 season saw an export of nearly 4,000 birds. The enormous yearly increase of egg and poultry imports into England indicates that an excellent outlet exists for any surplus that South Australia may have.

Helping the Poultry Farmers.

The Government has spared and is sparing no effort to help poultry-raisers and generally promote the industry. Bulletins are issued giving instructions concerning suitable breeds, methods of breeding, and the requirements of inter-State and over-sea markets. The State expert delivers lectures at suburban and rural centres, and gives practical demonstrations in the yards. Interest in the industry was never so great as it is at the present time. Breeding-houses are springing into existence everywhere. At the Roseworthy Agricultural College a well-equipped breeding and experimental poultry station has been established. Here large numbers of birds will be bred for export, and a less number of pure stock for sale to those desirous of purchasing. Experiments in feeding, housing, and incubation are being carried out, and

aviculture is included in the college diploma course. In addition, the Government has provided a large block of convenient yards and houses, in which laying competitions are being held. The competition pens each contain six hens. At the first test the winning pen produced 1,032 eggs in the twelve months; at the second competition, 1,251 eggs; the third, 1,343; and the fourth, 1,531, conclusively showing what splendid results are following high-class breeding. In the last test the average was 1,080 eggs for each of the 75 pens of six hens. These competitions are doing a great deal to arouse public attention to the commercial possibilities of the industry. South Australian bred fowls hold the world's record for the greatest number of eggs produced in a given time.

Good work is also done in the direction of organising numerous small centres on the Danish system. At various points throughout the State breeders combine to collect and deliver their poultry and eggs, and forward them at frequent intervals, so that they may be marketed in the best condition. Special effort is made by the expert to encourage the production of infertile eggs on account of their superior keeping qualities.



Duck-raising is a Profitable Industry.

[W. S. Smith. Photo.]

Improving the Breeds of Fowls.

During the last 10 or 12 years there has been a marked improvement in the general type of farm poultry. Birds of greater productive powers have been distributed far and wide, and this fact accounts largely for the satisfactory increase in the trade.

There is an extensive area of suitable poultry country within 50 miles of our railways and ports. South Australia has the climate and the soil. The most satisfactory foods can be grown next to the poultry yard. The transit is short, and although the business of over-sea export is a comparatively new one, the facilities of carriage and treatment are in every way commendable. Either a railway or a shipping centre may be quickly reached by the producer, and the possibility of deterioration is reduced to a legitimate minimum. Whereas 10 years ago few had any faith in the poultry industry, it is now recognised that poultry-farming can be made a profitable business. The commercial aspect has been proved, and breeders are opening out on a big scale. Altogether the trade is being carefully organised under the direction of the Government Expert, Mr. D. F. Laurie, and in a few years it must become one of considerable national importance.

CHAPTER XVIII.

MINOR RURAL INDUSTRIES.



THE climate and soil of this State are so favorable to the production of all kinds of grain, fruit, vegetables, and fodders, that there is practically no limit to what, in a comparative sense, may be regarded as "minor rural industries." The term is employed for convenience of classification and to ensure completeness. Many of the "minor" articles, indeed, really come in the category of important industries. Take the essentials for the fattening of stock. Maize and lucerne are grown extensively in various parts of South Australia, while peas, beans, and other fodder plants are largely cultivated. The gospel preached by agricultural experts has not fallen on deaf ears. On the Adelaide plains the production of lucerne for feeding dairy cows and for "topping up" cattle that have travelled long distances from Central Australian stations has developed into a large and lucrative business.

Olive Oil. "South Australia is among the favored few places to which Nature has granted a monopoly of olive cultivation." This is what the late Sir Samuel Davenport, the father of the industry, wrote many years ago, and his judgment cannot be questioned. Visiting experts, indeed, have affirmed that our natural conditions are in no respect inferior to those of the best olive districts of Southern Europe, and, years ago, the great Italian authority, Caruso, recognising the potentialities of this State as a producer of oil of the finest quality and in unlimited quantity, urged that the Italian cultivators should strengthen and increase the industry in view of the severe South Australian competition to which they would be subjected at no distant date. Olive oil manufactured in South Australia was sent to the Great Exhibition of 1851 and gained "honorable mention" on account of "its clearness, color, and flavor." South Australian oil has since that time taken numerous prizes in different parts of the world. It has been officially stated by experts that "no oil that has ever been sent into a market surpasses in quality, lucidity, and creamy delicateness of most delicious flavor the oil that is produced on the Adelaide plains."

South Australia is rich in the possession of olive stocks of reputation from Malaga, Gibraltar, and Lisbon, from Cannes, Nice, and South of France, and from Florence and Bari. "The calcareous nature of the soil around Adelaide," Sir Samuel Davenport once said, "and the warm and dry climate assist in bringing the fruit of the olive, as of the vine, to remarkable perfection; while for the benefit of the laborers, as well as of the farmers, the olive harvest conveniently follows on the vintage as the vintage follows on the harvest-time of various cereals."

In 1896 the number of trees in bearing was 49,609, and these produced 6,512galls. of oil; in 1906 the number of trees had increased to 85,433, while the yield of oil had reached 17,762galls. As far back as 1882 the olives planted at the Adelaide Gaol, from which the oil is extracted by prisoners for the City Corporation, were yielding a net return of £9 per acre, while at the present time there are 70 acres surrounding the institution. The following figures indicate the progress of the industry:—

Year.				Number of Trees.	Oil Made.	Year.				Number of Trees.	Oil Made.
					Gallons.						Gallons.
1897-8	..	..	..	51,824	5,310	1903-4	..	..	..	78,642	12,422
1898-9	..	..	..	57,337	3,180	1904-5	..	..	..	80,560	11,864
1900-1	..	..	..	61,577	4,865	1905-6	..	..	..	83,138	15,980
1901-2	..	..	..	61,740	6,520	1906-7	..	..	..	85,433	17,762
1902-3	..	..	..	66,852	11,327	1907-8	..	..	..	83,153	16,164



VIEWS ON A SOUTH AUSTRALIAN OSTRICH FARM.

[W. S. Smith, Photo

(CH. XVIII).

(Campbell House, Lake Alexandrina.)



The proprietor of the Beaumont olive plantation has stated that from 14 acres he harvested in 1908 40 tons of olives worth £8 per ton. The cost of picking amounted to £120, leaving a return of £200 from 14 acres. With a view to encouraging the planting of olives, Mr. Cleland recently offered to supply free of cost olive truncheons, and as a result received applications for 4,000, there being over 100 separate applicants, who were only asked to pay cost of carriage.

The best oil commands a substantial price locally, while the pickled berries are retailed at amounts which work out at not less than one halfpenny a piece. It may be pointed out that these figures rule in face of the fact that the appliances necessary for the extraction of the oil are of the simplest description, and that any man may, with a very small outlay, become his own oilmaker; while the preserving of the green berry, though necessitating time and care, involves very insignificant expense.

The wattle is extensively cultivated for its bark, and the industry is a growing one of some commercial importance. Thousands of tons are exported annually, and large quantities are used locally. Production has risen from 4,372 tons in 1891 to 9,212 tons in 1902, and 10,000 tons in 1907. Mr. J. H. Maiden, F.L.S., Curator of the Technological Museum, Sydney, and Consulting Botanist to the Forest Department, has written—"The broad-leaved wattle of South Australia is one of the richest tanning barks in the world. South Australia has practically the monopoly of this bark, and it is a grand heritage—the envy of the eastern States."

The growing of wattles (acacia) for the bark for tanning is carried on mainly in the southern part of the State. Over a large area the wattle grows naturally, and regular crops of bark are obtained without any outlay in respect to sowing and cultivation. Considerable areas of comparatively poor land have been cleared of the natural growths and sown to wattles with satisfactory results. The trees are fit to strip at five to seven years old, according to soil, &c.



A Good Crop of Piemelons—Grown Without Irrigation.

[Govt. Photo.]

Pig-breeding is carried on in conjunction with farming operations in most districts, while there are also several big establishments specially devoted to the breeding of pigs for bacon-curing. A large number of bacon-curing factories are in operation, and in addition to supplying the local demand, a considerable export trade is carried on with the neighboring States.

Hops. The South Australian climate in favored spots is admirably suited for hop production, and the same may be written in respect to tobacco. A few experiments have given satisfactory results, but nothing has been attempted on a commercial scale.

Figs. Figs thrive luxuriantly, and attention is now being paid to drying. A large quantity is utilised for jam-making.

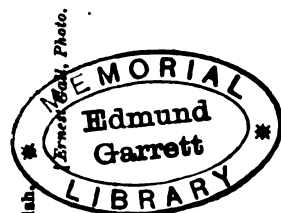
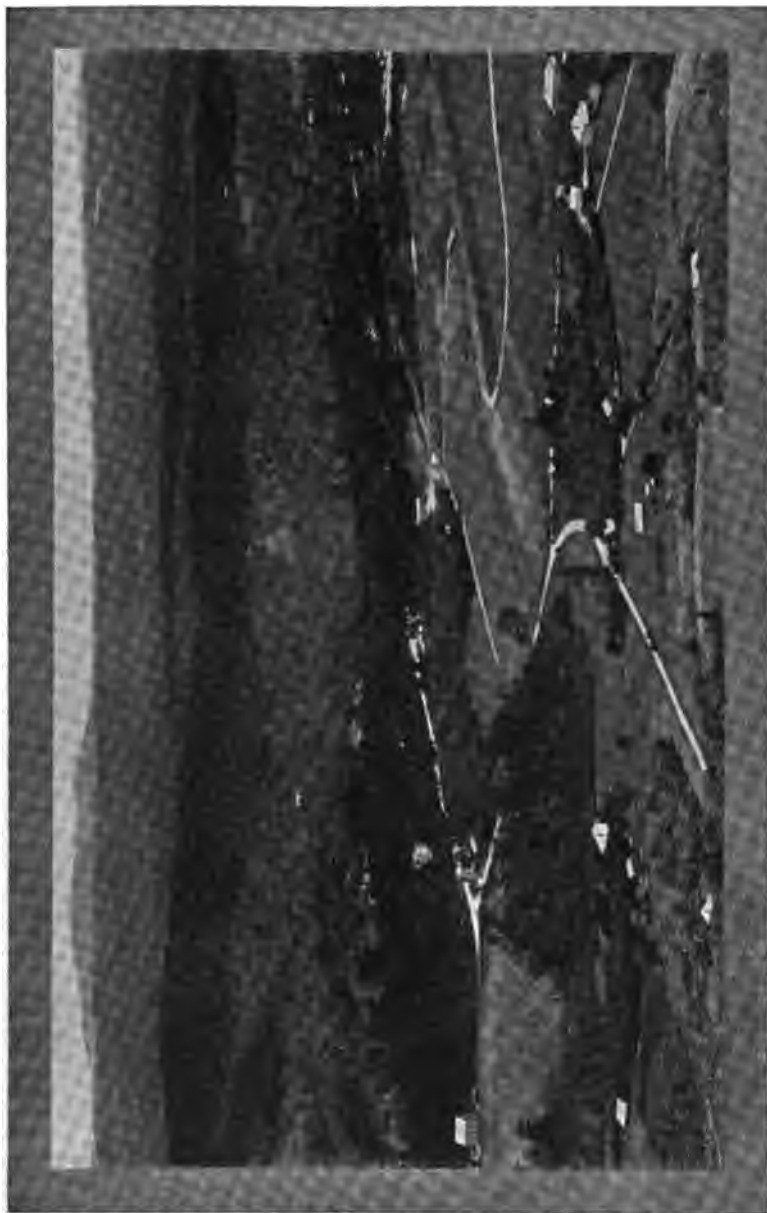
Preserving Fruit. Fruit drying, preserving, and canning are important industries conducted under the most approved methods. A large number of factories exist. Jam is extensively exported to the other States and to overseas markets, and the quality of the product has established a reputation of some value, In 1906-7 £24,394 worth was sent away. South Australian jams have been supplied to the War Office and to the navy stations, and repeated orders have testified to appreciation. On the Murray—at Renmark, in South Australia, and 'Mildura, in Victoria—the dried fruit business has assumed considerable dimensions. Here the sun-drying process, which ensures the retention of flavor and condition, is resorted to. The Australian Dried Fruits Association, which consists of growers from these big centres, has given the industry an organised status. The extent of operations may be gleaned from the fact that a recent conference in Adelaide the



Irrigated Maize, 15ft. to 16ft. in Height, Grown on the Adelaide Plains.

[W. S. Smith, Photo.]

growers present represented fruit as follows :—Lexias, 3,549 tons ; sultanas, 2,648 tons ; currants, 661 tons ; apricots, 180 tons ; peaches, 70 tons ; muscatels, 100 tons ; total, 7,208 tons, valued at £350,000. On this production it was estimated by an authority that there were dependent approximately 8,000 people. The total production in South Australia last season



Market Gardens in the Mount Lofty Ranges, where a Number of Minor Industries Flourish.

(1907-8) was 250 tons apricots. 41 tons apples, 60 tons pears, 40 tons prunes, 1,250 tons raisins, and about 1,600 tons of currants. Out of this quantity of fruit the whole of the currants and muscatels and a large proportion of the apricots and peaches were consumed within the Commonwealth. The production of lexias and sultanas, however, had already exceeded the

Australian consumption, and 2,300 tons had been exported. It was noted with pleasure that Australian fruit had met with a good reception, not only in the heart of the Empire, but throughout Canada, India, and other British possessions. For the first time the people of the United States of America in 1906 had been permitted to enjoy the dried fruits of Australia. In South Australia the local production of currants, apples, apricots, and peaches is short of requirements.

Bee-farming. In almost every part of the State bees do well, and honey production is being fostered. The number of hives in 1898 was 9,692, and 155,665lbs. of honey was produced. The latest figures (1908) show 24,866 hives and 1,200,000lbs. of honey. Up to the present local and inter-State markets have been depended upon to absorb the annual output, but the efforts of the South Australian Commercial Agent to open up an export trade with Great Britain promise well, the prices realised for shipments made during the past year being satisfactory to the producers.



A South Australian Bee Farm.

Ostrich Farms. Ostrich farms of some magnitude have been established in Far Northern localities and in the lakes districts, where the climate and physical conditions make home congenial to the birds and profitable to the owners. The feathers are large and lustrous.

Potatoes. Potatoes are cultivated to a considerable extent, the area under this crop exceeding 10,000 acres. Consideration has been given to the utilisation of the unmarketable potatoes for the manufacture of starch and alcohol for power purposes; and in view of the large areas in the South-East suited to the production of this crop, there should be room in the future for development in these directions. Onions for domestic use constitute another profitable crop. Turnips, mangolds, and other roots receive some attention in the cooler portions of the State, while rape is largely grown as a fodder crop.

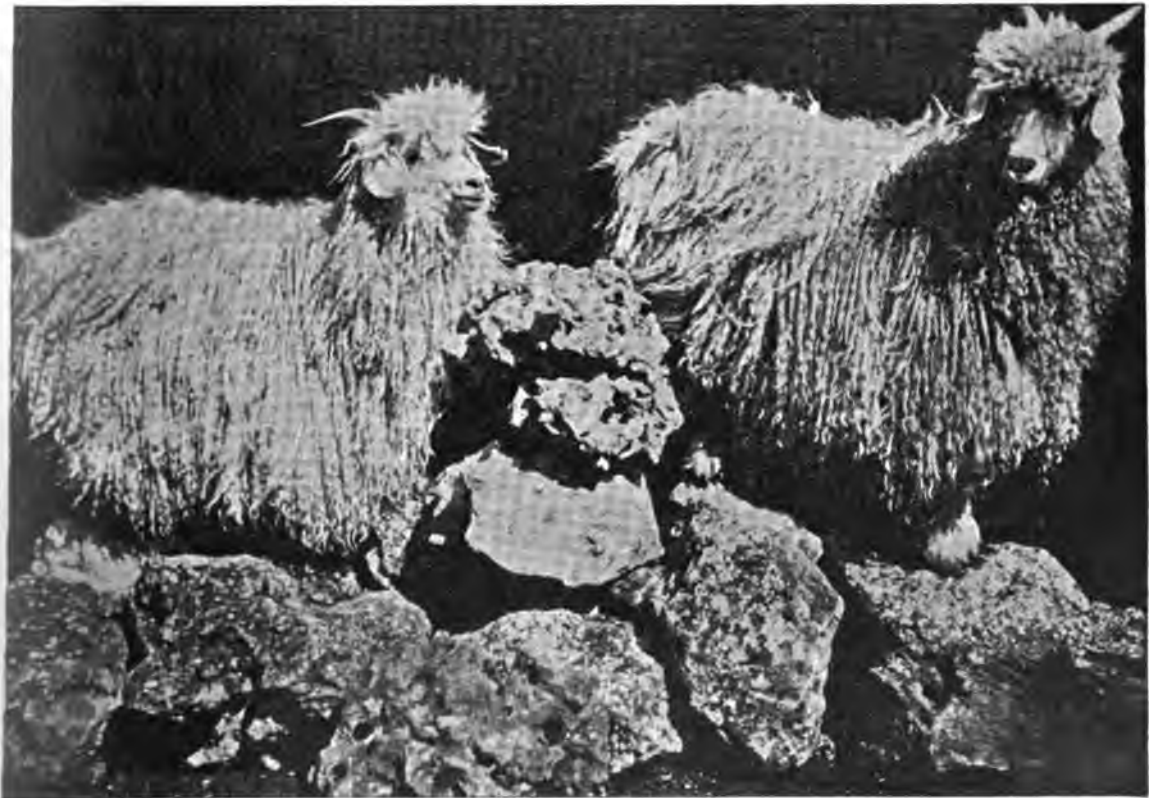
Market Gardens. An area of about 3,000 acres is devoted to the production of vegetables, the city, Broken Hill, Port Pirie, and the mining towns being the principal markets.

Angora Goats.

Herds of Angora goats are owned by South Australian pastoralists, and some beautiful fleeces have been cut. Although it has been proved that the animals do excellently in certain localities and return payable quantities of hair, the industry remains to be definitely and consistently established. The Angora does well in the drier regions of Central Australia. In the Northern Territory the progeny of a herd sent up some years ago returned highly remunerative prices, and extensive breeding is to be undertaken by the Government. The fleeces retain all their virtues under the conditions that obtain here.



Flock of Angora Goats Central Australia.



Angora Goats.—These Animals do well in Central Australia.

CHAPTER XIX.

HOW THE STATE HELPS PRODUCERS.



IN South Australia the State helps the producer in a variety of ways. The Government seeks to be philosopher, guide, and friend to the man on the land. Even after the homeseeker has secured his block and the equipment for working it, he is not left entirely to his own resources. The Government comes to his aid and assists him in securing the best results from his holding and in finding markets. No phase of soil cultivation escapes attention. There are experts on agriculture, viticulture, horticulture, dairying, poultry, wool, veterinary science, fertilisers, and so on. These officers are attached to the Department of Agriculture, and may be consulted without fee. Lectures are delivered by them at country centres all the year round, and in addition they conduct courses at the School of Mines and at the Roseworthy Agricultural College.

Agricultural Advisers.

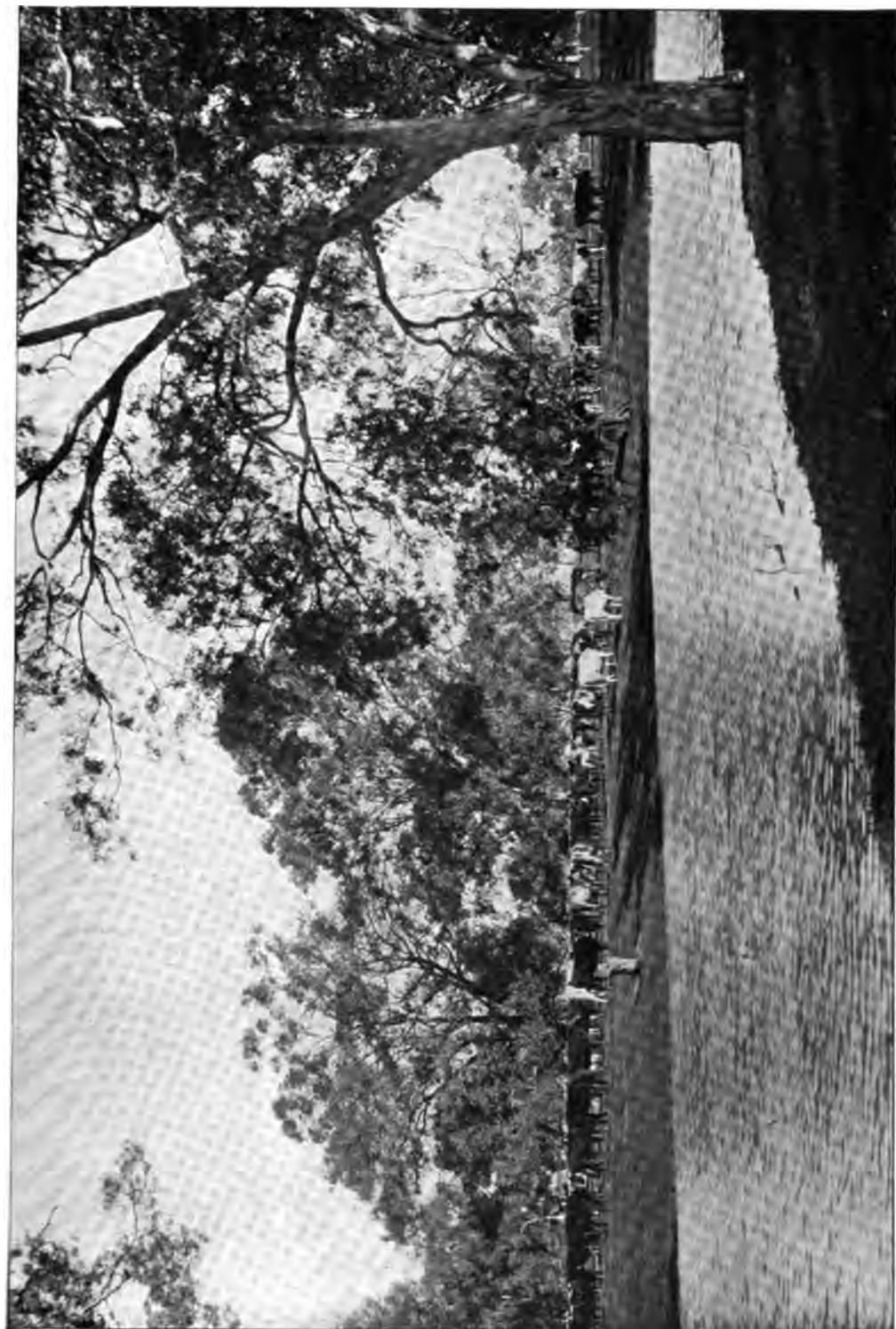
The Department of Agriculture is available to present and prospective settlers who may desire advice and instruction on agricultural matters—such as soil manipulation, the growing of various crops, the preparation of produce for market, the marketing of produce, the feeding and treatment of stock, &c. There is no excuse for ignorance. A monthly *Journal of Agriculture* is published at a small cost, and bulletins on special subjects are issued at frequent intervals.

Demonstration Farms.

Several State farms have been established in addition to numerous experimental plots for the guidance of settlers. Attached to the Agricultural College is a farm of about 1,500 acres. Here cereal-growing, stock-rearing, dairying, wine-making, and other pursuits are practised. At Parafield, comparatively close to the city, 80 acres are devoted to the testing of wheat varieties and to the improvement of wheats by cross-breeding and by selection. In the dry areas, with an average rainfall of about 10in. annually, two experimental blocks have been established. A small area of reclaimed swamp land is cultivated at Murray Bridge by the Agricultural Department in order to demonstrate to occupiers of similar land the best crops to grow and methods of cultivation, and at Kangaroo Island test farms have been started.

The Roseworthy Agricultural College is situated in the centre of the farming areas, about 25 miles from Adelaide. It was established in 1885 for the purpose of teaching young men the principles and practices of scientific agriculture. Attached to the College are chemical laboratories and lecture rooms, while on different parts of the farm are situated a well-equipped wine-making plant and cellars, a butter and cheese factory, incubator house, &c., besides the usual farm buildings. There is accommodation for 60 students, and each one is given full opportunity of making himself thoroughly acquainted with every detail of farm work and relative machinery. A few competent and experienced men are employed to help and instruct the students, but the bulk of the work on the farm is done by them. Each year from 250 to 500 acres are cropped with cereals and green crops, while the stock comprise about 80 head of dairy cattle, from 1,000 to 1,600 sheep, over 300 pigs, and a large number of poultry. The technical subjects taught at the College are general agriculture and live stock, viticulture and œnology, fruit culture, dairying, elementary veterinary science, book-keeping, surveying, wool-classing, and poultry-breeding. The fee is £30 per annum, and the course comprises nine sessions extending over three years.

A dairy farm has recently been established, where dairying is carried on under advanced scientific methods. At Turretfield, some miles from Gawler, there is a stud station for dairy cattle and a centre for expert demonstrational work.



(CH XIX.)

SCENE ON A SOUTH AUSTRALIAN CATTLE STATION.

[Chas. P. Scott, Photo.

Finding Markets. In order to promote the export trade in perishable produce, the Government Export Department was established at Port Adelaide, with freezing works and cold storage accommodation. This institution has done excellent exploratory works. Butter, wine, fruit, lambs, rabbits, poultry, eggs, honey, and other products are treated and shipped in behalf of the exporters at reasonable rates, which are based on charges sufficient to cover the cost and to ensure a return to the Government of fair interest on the capital invested. If desired by the shipper, the State undertakes the disposal of produce in Great Britain, where the Agent-General and the Commercial Agent are alert in the interests of the men on the soil.

Altogether the system of legitimate State aid to producers is an elaborate one, and considerable benefit has accrued therefrom to individual producers and the State in general.

Agricultural Staff. The following is a list of Government experts who are always available for the education and guidance of producers : —

Director and Professor of Agriculture—W. Angus, B.Sc.

Principal of Roseworthy Agricultural College and Professor of Viticulture—A. J. Perkins.

Horticultural Expert—G. Quinn.

Dairy Expert—P. H. Suter.

Poultry Expert—D. F. Laurie.

Wool Expert—W. J. Mathews.

Veterinary Surgeon—J. Desmond.

Chief Inspector of Stock—R. J. Needham.

Agent-General for South Australia—28, Threadneedle House, Bishopsgate Street Within, London.

Commercial Agent—28, Threadneedle House, Bishopsgate Street Within, London.

Where to Get Information. The undermentioned officers of the Government are charged with duties to the public in the branches mentioned—

The Surveyor-General deals with all questions pertaining to the surveying of, and making available, lands for selection.

The Land Board fixes the prices of the blocks and allots the land.

The Surveyor-General has prepared the leases and agreements, and sees to the collection of rents and purchase-money as they fall due. He also deals with all questions respecting vermin-destruction, blockers' loans, road deviations, &c.

The Principal of the Roseworthy Agricultural College presides over that institution and carries on experiments on the College farm.

The Director of Agriculture is responsible for research work, scientific investigation, wheat hybridisation, and dry farming, and other experiments at various stations throughout the State.

The Agricultural Department, North Terrace, Adelaide, furnishes information on all matters connected with agriculture.

The Conservator of Forests has charge of tree conservation and the rearing and distribution to the public of forest trees.

The Dairy Expert gives instruction in dairying, and delivers lectures on the subject at the Agricultural College and throughout the country. He will control the Government Dairy Farm about to be established at Turretfield, near Gawler, where students will be taken. The Government Butter Factory is also under his charge.

The Manager of the Produce Department takes charge of all descriptions of produce at the Produce Depot, Port Adelaide, stores same, and if desired forwards to London for sale. He has charge also of the lamb-buying and freezing operations.

The Director of the Tourist Bureau, King William Street, and the Intelligence Officer, Crown Lands Office, Government Offices, will afford inquirers information on any subject respecting South Australia.

The Horticultural Instructor and Chief Inspector of Fruit gives instruction on all horticultural questions, including planting, pruning, budding, and grafting. He also has under his care the inspecting of plants and fruits imported, for the prevention of introduction of fruit and plant diseases.

The Poultry Expert advises with respect to rearing, housing, and feeding poultry, and marketing of eggs.



Decorated Camel and Afghan Owner.—Much of the Carrying Trade of Central Australia is done by Camel Teams.

[F. J. Gillen, Photo.]



A COUNTRY SCENE: "THE GORGE."

CHAPTER XX.

LAND LAWS AND HINTS FOR INTENDING SETTLERS.



N the Imperial Act establishing South Australia as a British province the price of land was originally fixed at £1 per acre. Owing to difficulty experienced in raising the prescribed sum of £35,000 from the sale of lands—£20,000 of which was to be invested in Government securities in order that the mother country should bear no financial risk in the founding of the new province—the minimum was subsequently reduced to 12s. per acre. Under the modified scheme 437 lots of land, comprising a total of 58,995 acres, were granted under preliminary land orders, which also entitled the holder to a town acre, and these realised £35,397. There were also sold at the same price 20 town lots of 80 acres each, bringing the total territorial revenue up to £36,357. The minimum price of land in South Australia was thereupon raised to £1 per acre. Regulations made at the time provided that every applicant for land, in order to entitle himself to a grant, should pay a certain sum into a fund to be employed in bringing out laborers. Persons paying cash for 4,000 acres had the right to call for the survey of any compact district not exceeding in extent 16,000 acres. Under these provisions, up to December 22nd, 1837, in addition to the area already stated, 3,300 acres of country lands at £1 per acre, and 563 town acre lots for £3,594, had been alienated. In 1838 48,000, and in 1839 170,841 acres were disposed of, making a total of sales effected and amount realised up to January 1st, 1840, 283,507 acres for £262,240. Land continued to be dealt with under the original regulations until 1843, when the first local Act was passed. The land laws have undergone frequent alterations since then, and a large volume would be required to review the process of evolution necessary to meet the changing requirements. The initial mistake made was in seeking to transplant English methods of land tenure to a new country. Much mischief also resulted from the attempt to apply the same laws to lands varying in quality and subject to different climates. The difficulties of colonisation were indefinitely multiplied by these and other legislative and administrative errors. It was only after years of bitter experience and fluctuating fortunes that the vast territory which forms the State of South Australia came to be better understood. The flockmaster pushed his way back from the seaboard, testing the climate and the productive capacity of the soil as he went. The farmer followed with his plough, never heeding the warnings uttered by the squatter or such an authority as the late Mr. Goyder, for many years Surveyor-General. This officer personally surveyed and inspected large areas, and, being a man of keen observation, he noted the suddenness with which the country changed from large trees and rich grasses to stunted scrub and bare hills or vast plains of saltbush, bluebush, cotton-bush, and other herbage. He fixed what has since been known as Goyder's line of rainfall—a theoretical division which has proved to be singularly correct. The ancient theory, however, that rain "follows the plough" was firmly believed, and the agriculturist set his face northwards with a determination which was admirable. For some time land legislation was dictated by a popular demand for broad acres.

Encouraging Occupation of Crown Lands.

The upset price of country lands was fixed at £1 an acre, and as the financial wants of the province increased every effort was made to push on with the sale of land in order to bring in revenue. It was shortly after the first flush of excitement over the Victorian goldfields had subsided and the stream of population had begun to flow towards South Australia that settlement began to increase. In the year 1853 213,221 acres were sold for £291,660, and from that time onwards the acreage under cultivation rapidly expanded. In 1854 it stood at 129,692 acres. Five years later the cultivated area had increased to 361,884 acres, and in 1865 it was 660,569 acres. When power was granted to the local Legislature to pass land laws an attempt was at once made to encourage occupation. In 1869 an Act was passed providing for free selection after survey in declared areas, the selector being allowed a certain number of years in which to pay his purchase-money. He was compelled in the

meantime to pay interest at a moderate rate and to comply with conditions of residence and improvement. Reforms followed in quick succession, so rapid indeed that the land legislation of the country was confusing even to those whose duty it was to administer the laws. Every new Parliament made an attempt to improve on the land laws, and whole Acts were bodily repealed, or special clauses were amended and patchwork legislation was resorted to. The chaotic condition of the land laws, after such lightning changes, made a consolidating measure imperative, and in 1878 the Crown Lands Consolidation Act came into operation. The area alienated from the Crown in fee simple, including completed purchases, at that time totalled 4,970,940 acres, realising £6,362,059, and the area held on credit after deducting revoked and abandoned selections and completed purchases was 2,509,606 acres, on which the sum of £3,534,576 was agreed to be paid. The population then stood at 236,000, and the area under



Camel Caravan, Central Australia (Carrying Calves).

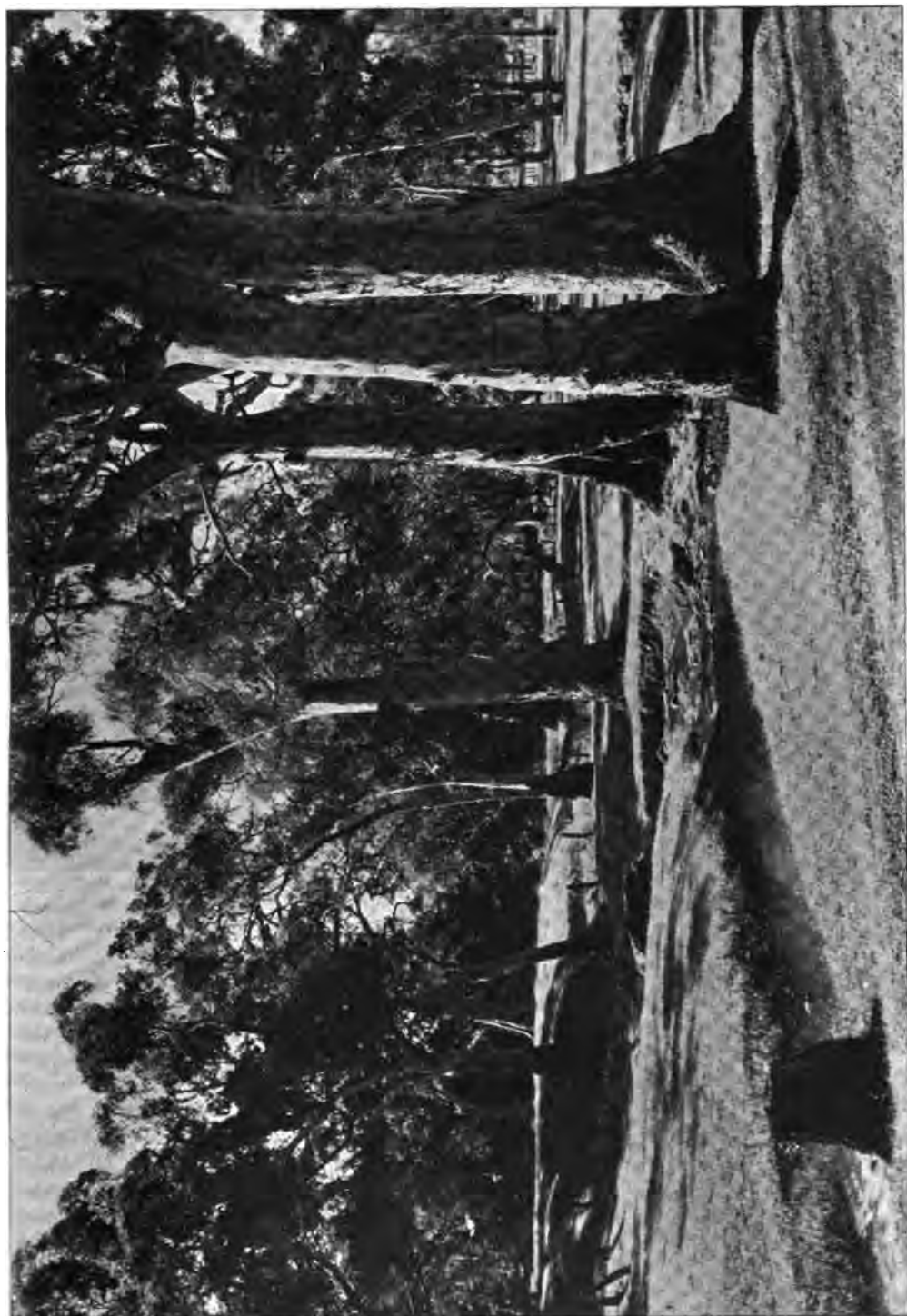
[F. J. Gillen, Photo.]

cultivation at 1,828,000 acres, giving an average area of about 31 acres sold or selected land for each person, of which area seven and three-quarter acres were under cultivation. Crown lands continued to be alienated for some years until a resolution was carried in Parliament stopping the sale of public lands and adopting exclusively a system of leasing. This method has since been partially abandoned.

Closer Settlement Liberal Terms.

In 1898, in order to meet the growing demand for land, an Act was passed providing for the purchase of freehold lands for closer settlement. These were to be let on perpetual lease at a fixed rental of not less than 4 per cent. on the amount paid for purchase-money, together with any expenses incurred in connection with the purchase. Subsequent legislation provided for lands so purchased being disposed of on agreement with covenant to purchase, the purchase-money being payable by 60 half-yearly instalments, with interest at the rate of not less than 4 per cent. per annum.

During the 1903 session of Parliament an Act to consolidate the Crown Lands Acts became law. This Act re-enacted the provisions for Crown lands being let under perpetual lease at a fixed rental for all time and not subject to revaluation or disposed of under agreement with covenant to purchase by 60 half-yearly payments, with interest at not less than 2 per cent. nor more than 4 per cent. per annum. The purchase may be completed at any time after the



GIANT GUMS ALONG THE FOOTHILLS NEAR ADELAIDE.

first six years of the agreement. In the case of lands repurchased by the Government and subdivided for closer settlement, more recent legislation (1905) provides for payment of interest only at 4 per cent. per annum for the first five years, after which interest and principal become payable as in the case of ordinary Crown lands. Provision is also made for those holders of repurchased lands let on perpetual lease surrendering and obtaining agreements with covenants to purchase in lieu of the perpetual leases. The purchasers of closer settlement land may obtain the fee simple of their holdings at any time after the first nine years on payment of the balance of the purchase-money and interest up to date. Up to the 30th June, 349,802 acres, including 14,716 acres of leasehold, have been purchased at a cost of £883,150 and disposed of to suitable purchasers, most of whom are successfully occupying their holdings. In place of comparatively few persons on the land at the time of purchase there is now a population of 3,945 adults and children on these repurchased lands.



Typical Survey Camp.—The First Step in Making Crown Lands Available for Settlement.

[E. Duryea, Photo.]

Extending the Area of Cultivation.

Since 1905 the railway from Tailem Bend to Pinnaroo has been completed and opened, and an area of land over 700,000 acres on either side of this line, and within the schedule to the Pinnaroo Railway Act, has been taken up under covenant to purchase. A considerable area is already cleared and under crop, and it is estimated that during the next two or three years at least 100,000 acres of the area already held will be under cultivation. The purchasers of these lands can obtain their titles at any time on payment of the balance of purchase-money and interest.

Reclaimed Swamp Lands.

In 1905 a measure was placed on the Statute Book providing for the reclamation of swamp lands. This has already resulted in nearly 1,000 acres at Murray Bridge having been reclaimed and allotted on perpetual lease in small blocks of sufficient area, under intense culture, to support a family. The terms of payment are very liberal. During the first year one quarter of the rental is paid, one-half during the second year, three-quarters during the third year, and the full rent becomes payable during the fourth year of the term. A much larger area is now in course of reclamation, and will be available for settlement during the next 12 months.

The reclaimed areas are under the control of boards of trustees, and the State may advance loans to lessees for the purpose of effecting improvements which permanently increase the capital value of the land. In connection with these swamp lands adjoining higher lands have been purchased where such are necessary and disposed of to lessees of swamp blocks for residential purposes on similar conditions of purchase as obtain in lands purchased for closer settlement or perpetual lease.

Pastoral Lands. In no direction have greater changes been made in the land law than in the treatment of pastoral country outside of hundreds. A pastoral lease is now practically identical with a perpetual lease.

The country can only be resumed when it can be shown that it is required for purposes of "intense culture." Pastoral country likely to be required for closer settlement may be leased for 21 years; all other pastoral lands may be let for 42 years, subject to revaluation of the rent for the last 21 years. In each case the Pastoral Board fixes the rent, having regard to the carrying capacity of the land for depasturing the stock, the value of land for agricultural or other purposes, the proximity and facilities of approach to railway stations, ports, rivers, or markets, and any other circumstances affecting the value of the land to a lessee. In revaluing the rent for the second period of 21 years, the amount fixed shall not be more than 50 per cent. higher or lower than the rent payable for the first period of 21 years. The lessees are required to pay the value of the improvements as fixed by the Pastoral Board in 21 or 42 annual instalments (according to the term of the lease), principal, and interest at 4 per cent. per annum. The lands are advertised open to a given date, and all applications received up to that time are considered by the board, which allots the leases to the most desirable applicants. All such allotments must be approved by the Commissioner of Crown Lands. In the event of resumption for any purpose the lessees are entitled to be paid the value of the improvements effected by them, as well as compensation for loss occasioned by resumption. If the land is required for any public purpose one month's notice of intention to resume is necessary. If for intense culture one year's notice of intended resumption is required. The lessees are entitled to receive payment for improvements from the incoming tenant if the lands are let to other tenants at the expiration of the term of the lease.



A Beauty Spot on the Hindmarsh River, near Victor Harbor—A Popular Tourists' Resort.

The State as Landlord. The land laws of the State are on a liberal basis, and elasticity and sympathy characterise their administration.

There is a genuine desire to encourage settlement, and in no other State in the Commonwealth is the outlook brighter for the producer possessed of brains and moderate capital. Homeseekers will find the State a liberal landlord.

Lands Open for Application. Crown lands are continually being surveyed and offered to the public under agreement with covenant to purchase and perpetual lease. Much of this land, although not of first-class quality, is suitable for wheat-growing with the aid of superphosphates and the improved methods of cultivation. There are now about 1,290,000 acres of Crown land open to application.

Points for Landseekers.

Areas suitable for farms may be taken up of sizes varying according to the quality, of a value of £5,000, or of pasture land only, for 5,000 sheep, or in dry areas 10,000 sheep. These lands may be held either on perpetual lease or on agreement to purchase. In the latter

case the payments, made half-yearly, after deducting interest, go towards purchase-money, and on 60 such payments being made the purchase is complete.

If taken on perpetual lease the annual rental will be according to the value of the land, from about $\frac{1}{4}$ d. to about 1s. per acre, according to quality. If on agreement to purchase the price will be from 2s. 6d. to about £1 per acre.

Repurchased lands must be taken on agreement to purchase, and may be held up to £2,000 worth unimproved value; improved blocks and grazing land up to £4,000 worth. The purchase-money must be paid in 70 half yearly instalments (the first 10 payments will be interest only, which will be 4 per cent. on the purchase-money). Purchase may be completed by paying balance of purchase-money after holding the land nine years.

Homestead blocks up to £100 worth may be taken on perpetual lease or agreement to purchase. These are meant for workmen's homes, not to make a living on, but to devote their spare time upon while not employed elsewhere.

Leases are issued for 21 years, 640 acres for removal of guano, or other deposits, and for lands resumed for water, or if artesian, five square miles, also for small areas for sites for manufactures, wharves, buildings, or other purposes.

Town allotments are small blocks for townships, and are sold by auction for cash.

The Land Board, composed of three members, arranges the subdivision of lands.

As soon as surveys are completed the board fixes the price at which each block is to be offered, and, when approved by the Commissioner, full particulars of area, &c., are published.

Advances up to £50 may be made to homestead blockholders to assist in erection of buildings and other improvements.

Advances up to £75 may also be made to lessees of reclaimed lands for the purpose of effecting improvements on their holdings.

Vermin-proof wire netting is advanced to landholders on easy terms, repayable in annual instalments.

The cost of preparing land, sowing, and harvesting a wheat crop varies, according to methods adopted and the districts, from about 15s. to 30s. per acre; 25s. an acre is considered a fair average cost, including seed and all expenses excepting manure.

Phosphate is the fertiliser used for wheat crops. In South Australia there are immense deposits of this, many of which are being worked and treated; large quantities are also being imported. The quantity placed on the land varies from 70lbs. per acre in dry districts to 140lbs. where there is a good rainfall. The cost is from 4s. 6d. to 5s. 6d. per hundredweight, according to quality.



The Pioneer as Pathfinder.—Donkey Teams at Work on the Outposts of Civilization.

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TWO VIEWS OF THE SILVER-LEAD SMELTING WORKS AT PORT PIRIE:
 (CH. XXI.) The Largest Silver-lead Smelters in the World.

CHAPTER XXI.

MINING.

IN a valuable compilation, "Record of the Mines of South Australia," compiled under the authority of the Hon. L. O'Loughlin (Minister of Mines) by Mr. Lionel C. E. Gee (General Assistant and Recorder, the Government Geologist (Mr. H. Y. L. Brown, F.G.S.) supplies a sketch of mining, from which the following is taken :—"What is believed to have been the first authentic discovery of gold in Australia, to which public attention was called and from which actual mining operations resulted, was made in January, 1846, about 10 miles E. from the city of Adelaide; but although the precious metal has been found at many places over large areas, yet as a gold-producer South Australia ranks last of the States of the Commonwealth. The principal auriferous districts are in the main range from its S. portion through Echunga, Talunga, Barossa, and Ulooloo to Wonna, about 140 miles N. from the city; thence N.E., Mount Grainger, Waukaringa, Mannahill.



Prospectors Looking for Gold, MacDonnell Ranges, Central Australia.

Wadnaminga, and Olary districts. The best find of alluvial gold yet made was in the saltbush and low hills country of Teetulpa, about 200 miles N.E. by N. of Adelaide; this was discovered in October, 1886. The area was small, and the ground was soon worked out, but it is estimated that about £300,000 worth of gold has been obtained from an area not exceeding one square mile. An immense district of similar country surrounds this place, and much desultory prospecting has been done, but so far Teetulpa remains the solitary rich patch unearthed here. Rich gold reefs have been discovered at Tarcoola, about 300 miles N.W. from Port Augusta. Gold has also been found in the Peake and Denison ranges, and near Yudnamutana, in the N. portion of the main range. To compensate for the lack of gold, South Australia is the chief

copper-producer of the group. The Burra Burra Mine, about 100 miles N. of Adelaide, has yielded nearly £5,000,000 worth of copper. The Wallaroo and Moonta Mines on Yorke's Peninsula have extracted up to date copper valued at about £12,500,000. The Kapunda Mine, which is the oldest copper mine in the State, having been discovered in 1842, situated 50 miles N. of Adelaide, has also produced a large quantity of very high-class copper. Throughout a large portion of the State more or less copper is found, and in the N. portion of the main range and the adjacent country a large number of copper mines and prospects are being worked. Silver-lead mines exist in the main range S. of Adelaide. The Wheal Gawler Mine, near Glen Osmond, was originally opened in May, 1841, and is probably the first mine worked in Australia. Deposits of silver-lead exist also in the N.E., from Farina and W. from Beltana. Large deposits



A Gold Escort conveying £50,000 from Mines to Bank.

of iron are numerous, the principal one being the Iron Knob, situated about 40 miles W.S.W. from Port Augusta. Here a vast quantity, estimated at 21,000,000 tons, of high-grade (66 per cent.) iron ore and manganic iron is in sight. It is connected by a railway with False Bay, on Spencer's Gulf, and the ore is used at present as flux in the Broken Hill Proprietary's works at Port Pirie. The magnitude and importance of this deposit are, so far, not equalled in Australasia. Large deposits of phosphate rock, containing as high as 81 per cent. tricalcic phosphate, have been found for a distance of 200 miles along the main range—from Mount Magificent in the S. to Carrieton in the N.—and at Clinton, on Yorke's Peninsula. The principal localities are Belvidere and St. John's, near Kapunda; hundred Bright, near Burra; hundred Bendleby, near Carrieton in the N.; Clinton and hundred of Cunningham, Yorke's Peninsula:

and Mount Magnificent and near Noarlunga in the S. Respecting the rare minerals, a discovery of uranium (carnotite) and vanadium ore has been made in the Olary district, but it has not, so far, proved of economic value. Vanadium ores are also found in other localities. Monazite in small quantity has also been recently discovered."

Mining Operations. The State contains a large area of metal-bearing rocks, and the Government Geologist, after many years of patient, intelligent labor, is able to make this official declaration—"I have no hesitation in saying that South Australia is exceptionally well endowed with minerals. The full recognition and exploitation of its wealth in this direction is in any case only a matter of time." The area held under Mining Acts on December 31st, 1907, was as follows :—

Nature of Holding.										Number.	Area.
Mineral leases	..	..	..	..	..	..	..	..	..	348	13,920 acres
Gold leases	..	..	..	..	..	..	..	..	..	108	2,008 "
Gold dredging leases	..	..	..	..	..	..	..	..	..	40	5,944 "
Miscellaneous leases	..	..	..	..	..	..	..	..	..	36	7,265 "
Mineral claims	..	..	..	..	..	..	..	..	..	896	29,568 "
Occupation licences	..	..	..	..	..	..	..	..	..	248	120 "
Search licences	..	..	..	..	..	..	..	..	..	108	111,360 "
Total holdings										1,784	170,185 acres
REGISTERED FROM JULY 1st, 1907, TO DECEMBER 31st, 1907.											
Mineral claims	..	..	..	..	..	..	..	..	..	151	4,983 acres
Gold leases	..	..	..	..	..	..	..	..	..	9	180 "
Mineral leases	..	..	..	..	..	..	..	..	..	35	1,390 "
Miscellaneous leases	..	..	..	..	..	..	..	..	..	2	79 "
Miners' rights	..	..	..	..	..	..	..	..	..	613	—
Search licences	..	..	..	..	..	..	..	..	..	43	35,840 "
Total										853	42,472 acres

The number of men employed in mining and mineral works, December 31st, 1907 :—

Copper	..	..	..	..	..	..	..	..	..	..	4,500
Gold	..	..	..	..	..	..	..	..	..	..	900
Salt	..	..	..	..	..	..	..	..	..	..	450
Silver-lead	..	..	..	..	..	..	..	..	..	..	50
Other minerals	..	..	..	..	..	..	..	..	..	..	500
Total											6,400

The Secretary for Mines (Mr. T. Duffield), writing on March 2nd, 1908, said—"The great fall in the price of copper, our chief mineral, has had a depressing effect on all mining matters; but despite this the total value of the mineral productions of the State for the six months ended December 31st, 1907, is estimated at £330,000, and there is good reason for believing that the inevitable demand for the red metal for increasing industrial activities will ensure for it a price at which our deposits can be profitably worked."

From the far northern part of the State to the Northern Territory precious stones have been found. Of the products which come out of the earth, South Australia has valuable salt deposits, as well as superior marble and slate. Mineral oil is said to exist in several places, but so far the expectations of experts have not been realised. Coal has been struck 370 miles north of Adelaide. It is to copper that South Australia is chiefly indebted for the development of the mineral industry. The bronze metal was first brought to light early in the forties, and

about the same time the existence of gold became known. The manner in which the first copper mines were discovered would form material for the novelist. The lonely boundary rider, the shepherd intent on finding the best pasture for his flock, the roving prospector literally stumbled across stores of treasure which have yielded enormous wealth to individuals and the State. From 1840 to the end of 1906 the following quantities and values account for the "ascertained" extent of the industry in this State. It is quite certain, however, that the figures greatly understate the true position, as for many years no official statistics were kept :—

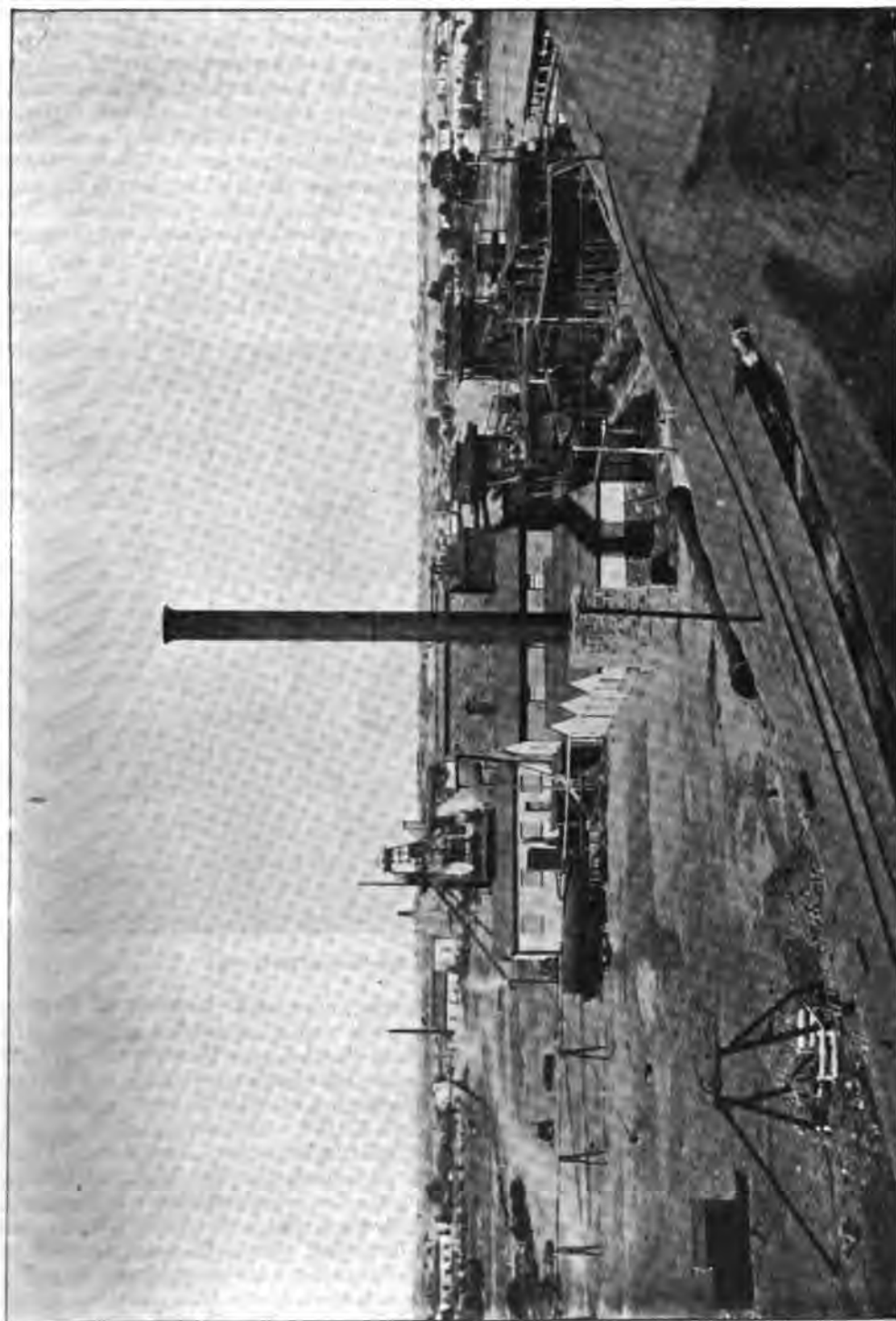
										Quantity.	Value.
											£
Gold	..	..	..	..	..	..	..	..	..	185,687 ozs.	1,256,479
Silver	..	..	..	..	..	..	..	..	..	12,516 ozs.	1,770
Silver-lead ore	..	..	..	..	..	..	..	..	..	15,000 tons	218,979
Copper	..	..	..	..	..	..	..	..	..	5,091,448 cwts.	18,743,481
Copper ore and regulus	..	..	..	..	..	..	..	..	..	699,737 tons	6,654,884
Lead	..	..	..	..	..	..	..	..	..	118,410 cwts.	102,153
Manganese ore	..	..	..	..	..	..	..	..	..	13,267 tons	46,232
Bismuth ore	..	..	..	..	..	..	..	..	..	1,402 cwts.	16,679
Ironstone flux	..	..	..	..	..	..	..	..	..	291,328 tons	156,232
Limestone flux	..	..	..	..	..	..	..	..	..	119,878 tons	16,098
Phosphate rock	..	..	..	..	..	..	..	..	..	14,850 tons	14,850
Crude salt	..	..	..	..	..	..	..	..	..	167,500 tons	64,500
Other minerals	..	..	..	..	..	..	..	..	..	—	15,624
Total value	..	..	..	..	..	..	..	..	..	—	£27,308,351

Such a record is striking testimony not only to the pioneer work done in this department of industrial development, but to the extent of mineral deposits in the State.



Mining Camp near Aritunga Goldfields, MacDonnell Ranges.

[J. H. Harris. Photo.]



Copper. South Australia has always been recognised as the "Copper State" of Australia. The first discovery was made in 1842 by Messrs. F. S. Dutton and C. S. Bagot, at Kapunda, about 50 miles north-east of Adelaide. Operations were started in the following year, and from the outset they proved profitable. There were many obstacles to be overcome in those early days, but the pioneers of the State were men not to be daunted. All the material raised had to be carted to Adelaide by road, while bullock drays had to be requisitioned for the conveyance of stores to the field. The first ore was raised on January 8, 1844, and on the 23rd of the same month a small parcel was sent away. Four lodes were revealed varying from 4ft. to 6in. in width, the proportion of metal to the ton running about 18½ per cent. In 1879 the mine was sold under liquidation, having yielded 70,000 tons of ore. For a number of years afterwards the property was worked by tributers, but of recent years operations were suspended owing to a large influx of water. The Burra was also the centre of considerable activity at one time, and the mine there paid £800,000 in dividends on a capital investment of £12,520. When work was suspended the total value of ore raised



Wallaroo Copper Mines.—Office Shaft, Ore-dressing Plant, &c.

was computed at £4,750,000. The most profitable copper mines are to be found on Yorke's Peninsula. The Wallaroo and Moonta Mining Companies were amalgamated in 1889. In an interesting review of the operations of these companies Mr. H. Lipson Hancock (the General Manager) states that the Wallaroo Company was for some time a private concern, and during that period did not publish any records. From what information is available, however, it would appear that during its separate existence it produced £2,229,096 worth of copper, in addition to £339,000 from purchased ores, and paid about £430,254 in dividends. The Moonta Company during its existence produced £5,396,146 worth of copper, and distributed £1,168,000 amongst shareholders. It had the distinction of being the first mining company in Australia to pay over £1,000,000 in dividends, notwithstanding that the rich gold reefs of Victoria had been worked for years before the Moonta lodes were discovered. Since the amalgamation in 1889, and to the 30th June, 1907, about £5,463,565 worth of copper has been produced, of which £412,000 has been distributed in dividends. In 47 years these mines have provided about £13,944,445 worth of copper, and paid £2,018,254 as dividends. The following statistics may



also be of interest ; although the figures are not absolutely correct they may be taken as substantially so :—Total dressed ore produced from the mines to June 30th, 1907, 1,670,360 tons ; average copper contents, 15 per cent., representing in fine copper, 248,993 tons ; average yearly production of dressed ore, 35,540 tons ; maximum output of dressed ore in any one year, 53,518 tons ; total expenditure, £11,285,809 ; average annual expenditure, £240,123 ; average cost of each ton of dressed ore, £6 15s. 2d. ; number of employes, June, 1907, 3,107 ; total amount of dividends, £2,018,254. Four thousand one hundred and thirty-seven acres are held under mineral lease from the Government for a term of 99 years, of which about 70 have yet to run. The rental is 1s. per acre per annum, and a royalty of 2½ per cent. on the declared profits. In connection with these mines are extensive smelting works, situated at Wallaroo, and sulphuric acid works.

There are extensive, well-defined copper lodes in various parts of the State, and before the price of metal declined extensive operations were being conducted in the Far North.



Wallaroo Copper Mines, showing Ventilating Fan.

Gold Mines. The remarks regarding the wide distribution of copper apply in an even greater degree to the gold, though it unfortunately cannot be said that the gold mines have come within measurable distance of the copper mines as regards the value of the yield. The precious metal was unearthed as early as copper, the Victoria Mine, about 10 miles from Adelaide, being opened in 1846. The major portion of the gold-bearing country to the south of Adelaide is on land which was alienated from the Crown in the early days, and consequently returns are incomplete. Alluvial gold has been worked for many years in the numerous gullies in the Adelaide hills. Amongst other localities in the northern areas, Teetulpa may perhaps be considered the most important alluvial field, it being estimated that over £300,000 worth of gold was quickly obtained there. Valuable reefing fields have been discovered in the Echunga district, at Mount Grainger, Barossa, Wadnaminga, Mannahill, Nillinghoo, and other localities, and it is generally agreed that these reefs have not been developed as their undoubted richness warrants. The Echunga diggings became known early in 1852. Prospectors came across some very rich surface shows, and even down to the

present day small bodies of men have made a good living as the result of mining operations at this part. No "mines" have, however, been developed. It is estimated that at least some 300 reputed gold mines have at various times been started, but most of them have been abandoned. A few years ago gold was discovered at Tarcoola, situated about 360 miles north-westerly from Adelaide, and 170 miles from the Coward Springs Railway Station. This field is still being worked.

Silver-Lead. In the Mount Lofty Ranges, close to Adelaide, and to the southward, are large deposits of silver-lead, in many cases associated with gold, copper, and zinc, so far only partially and unsatisfactorily prospected and worked. As instances may be mentioned the Glen Osmond Mines (close to the City of Adelaide), Aclare, Almanda, Kangarilla, Mount Malvern, Scott's Creek, Talisker, and Wheal Ellen. In the North-East many prospecting shows have been found, and in the North large bodies of ore exist at Eadiacara, Avondale, Duck Ponds Hill, and other places.

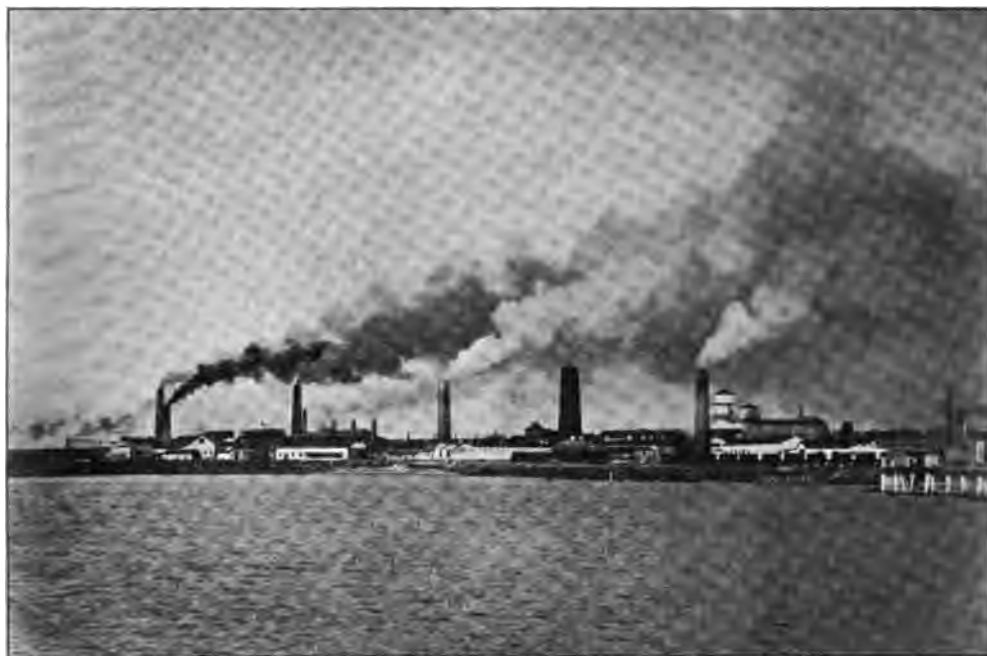


Wallaroo Smelting Works from the South-West.

Deposits of Iron. South Australia possesses an abundance of iron. Many deposits are in close proximity to railway lines and the sea coast. Large quantities of iron raised in the State are used as flux for smelting purposes, and in most localities the ore carries a small percentage of gold. When giving evidence recently before the Federal Royal Committee appointed to inquire into the provisions of a Bill relating to bonuses for the encouragement of the manufacture of iron in the Commonwealth, Mr. H. Y. L. Brown (Government Geologist) stated that South Australia was capable of supplying all the ore required for smelting works for centuries. He was not, however, prepared to say what kind of iron the ore would make, but did not think it advisable to smelt on the spot, but to ship the ore to some place where coal could be easily got. He instanced numerous places where some millions of tons of ore were available. The best known deposit at present being worked is the Iron Knob, a veritable hill of iron of high percentage, about 50 miles from the Spencer's Gulf seaboard. The property on which the deposits occur has been leased by the Broken Hill Proprietary Company, which has constructed a railway to the coast to facilitate the transport of the ore to the company's smelting works at Port Pirie.

Coal.

So far as is known there are no coal measures in South Australia of the age of those that are worked in New South Wales. There is a great gap in the series of formations, namely, from the Lower Palæozoic (Cambrian, Silurian, and Devonian) to the Cretaceous; none of the intervening rocks in that series having been observed outcropping upon the surface. Although this is unfortunately the case, still it is considered possible that beneath the thick deposits of Tertiary and Cretaceous age, which overlies the greater part of the older rocks, there may exist any of the older formations which occur in other parts of Australia. In 1890 boring for coal was started at Leigh Creek, and not long afterwards the labor of those concerned was crowned with success. The fuel, however, differs from the bituminous coal of Great Britain, New South Wales, or Victoria, and in some respects resembles the dense brown coal of Europe. When lighted it burns well, but the absence of cinder and the powdery ash produced render it difficult for economical use on ordinary fire-bars. Tests made by the Locomotive Department of the railways proved that the coal was not



Wallaroo Smelting Works, from the Sea.

as well adapted for use on the railways as that of New South Wales. Brown coal deposits have been found at Noarlunga, a few miles south of Adelaide, and work is in progress on a promising seam.

Mineral**Phosphates.**

The large extension of the use of artificial manures by farmers in this State causes great importance to be attached to the existence of rock phosphates. Partly as the result of a reward offered by the Government for the discovery of beds of this material a diligent search was instituted.

Deposits have been unearthed in several localities, and large quantities have been placed upon the market.

The phosphate deposits of South Australia are extensive and valuable, but at present, owing mainly to the competition of the high-grade rock from Christmas and Ocean Islands, the market for the local production is limited. As an example of the value of South Australian rock as a fertiliser, a parcel of over 1,000 tons was recently sold at 64½ per cent. tricalcic phosphate and contained only 2 per cent. of iron.

Mining Laws. Mining in South Australia is regulated by the Mining Act of 1893, which is characterised by extreme liberality and the inducements offered for prospecting an enormous area of practically new country. A miner's right is obtainable at a cost of 5s. This right holds good for one year from the date of issue, and may be renewed at any time during its currency for another term of one year on payment of 5s. The holder of a miner's right is authorised to prospect on any mineral lands for any metal, mineral, coal, or oil, and to peg out (of the prescribed shape and dimensions) gold, mineral, coal, and oil claims, and also leases of a like nature. A fee of 2s. 6d. is charged for registration. Gold claims must be registered at once and mineral claims within 30 days of pegging. The miner's right under which the claim was pegged must be produced to the registrar before registration can be effected, and must be renewed from year to year during its currency, or the claim is liable to forfeiture. Gold claims must be constantly worked—one man for each claim—and mineral claimholders must employ two men for each claim. Amalgamation of either gold or mineral claims reduces the labor conditions by one half.



Carrying Ore to Government Cyanide Works, Macdonnell Ranges.

Gold, mineral, coal, and oil leases are granted for a term of 42 years—the two former at a rental of 1s. per acre per annum and a royalty of 6d. in the pound on net profits, the latter at a rental of 6d. per acre per annum until coal or oil is found in payable quantities, when 1s. per acre is payable and a royalty of 6d. in the pound on the net profits. Working conditions provide in the case of gold leases for one man for every five acres; mineral leases, one man for every 10 acres; coal or oil leases, one man for every 40 acres. The Minister may permit the concentration of labor of the amalgamation of from not more than four adjoining gold or mineral leases. Miscellaneous leases are granted for salt, gypsum, mineral springs, site for smelting works and mining works. Maximum area of leases are—Gold, 20 acres; mineral, 40 acres; coal or oil, 640 acres; salt or gypsum, 640 acres; mineral springs, 40 acres; mining works, 10 acres; smelting works, 10 acres. Any number of gold, mineral, coal, or oil leases may be held by one person.

Under the Mining Act Amendment Act of 1900 licences to search for 12 months for precious stones, mineral phosphates, oil, rare metals, minerals, and earths are issued on specific mineral lands, not exceeding five square miles in area for one person, a fee of 20s. being charged for each square mile or portion thereof. These licences give a preferential right to a lease over a portion of the area, as prescribed. Subsidies are granted upon the recommendation of the Government Geologist and Inspector of Mines to persons or companies engaged in deep sinking, prospecting, or mining; and diamond drills are loaned under special conditions, and rewards for discoveries are paid out of money appropriated by Parliament for that purpose. A rebate of one-third of cost of freight if carried over the railway line for treatment is allowed to prospectors on the first 50 tons of ore raised—a concession which is largely availed of, and greatly assists prospectors in the initial development of their properties. Assays are made at the School of Mines free of cost for all samples obtained from Crown lands, while special arrangements for practical work in the laboratory can be made at very low fees.



A Prospector in Central Australia.

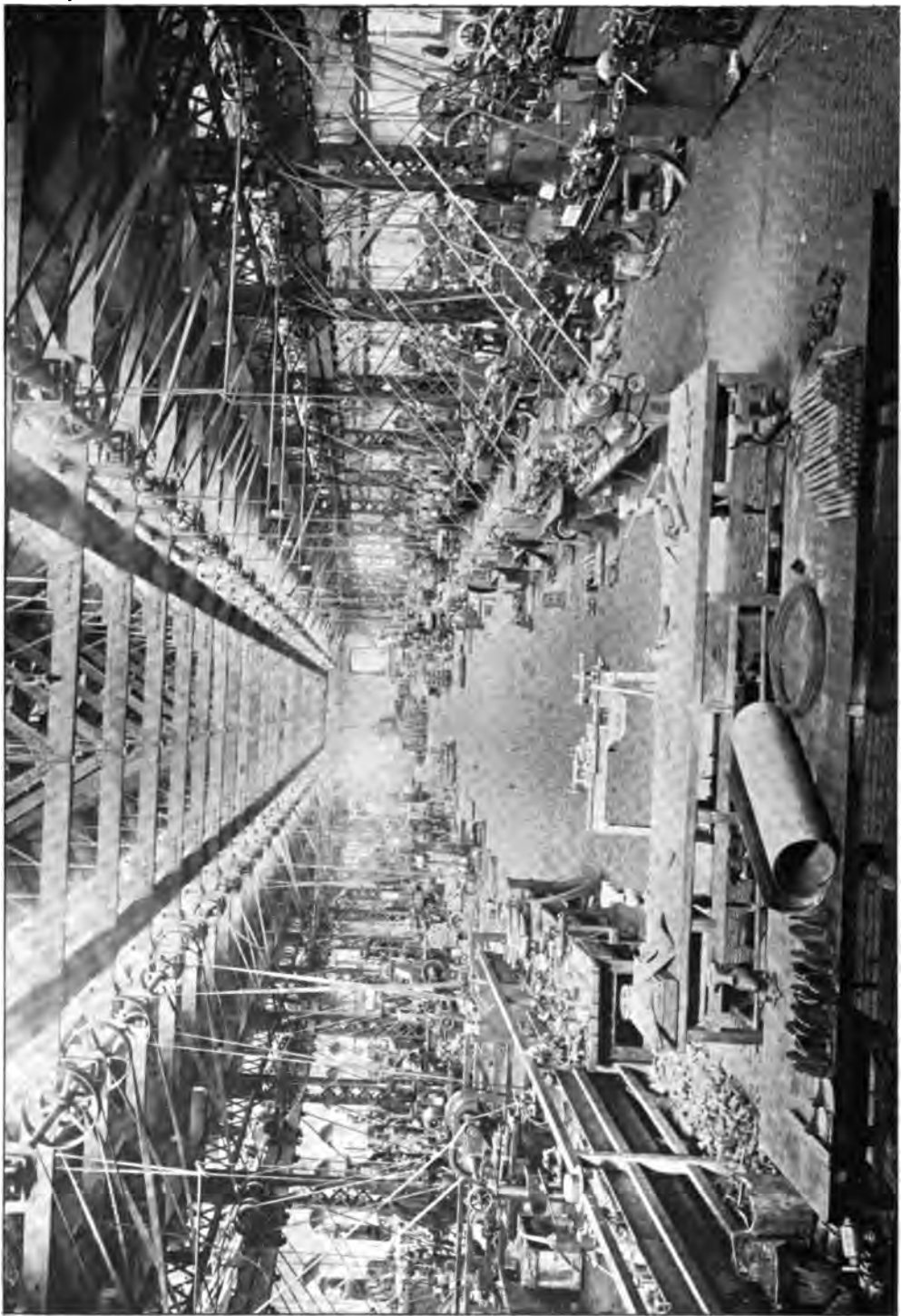
Respecting mining on private property the Act of 1888 and amending Acts of 1895 and 1899 provide for the resumption of private lands, proclamation of private land as an alluvial goldfield, and compulsory mining leases. In 1882 a Government Geologist was appointed, and results amply justified the wisdom of this step. In Mr. H. Y. L. Brown the State possesses an able, energetic, and withal cautious official, who has done much to help forward the mineral industry of South Australia, and also in connection with artesian water supplies. His efforts are well supported by the Chief Inspector of Mines (Captain W. H. Matthews) and the other members of the Mines Department, which comes under the control of the Minister of Mines. No genuine prospector will appeal in vain for advice to the department, while long distances are annually travelled by the officers in reporting upon or inspecting likely properties. Application made to Mr. L. C. E. Gee, Department of Mines, Adelaide, for information concerning the mineral deposits of the State will meet with a ready response.

DECENNIAL RETURN SHOWING OUTPUT AND VALUE OF VARIOUS METALS AND MINERALS PRODUCED IN SOUTH AUSTRALIA SO FAR AS CAN BE ASCERTAINED.

Year.	Gold.		Silver.		Silver-lead Ore.		Copper.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Ounces.	£	Ounces.	£	Tons.	£	Cwts.	£
1898	2,798	10,676	—	—	183	950	95,414	244,865
1899	3,893	15,582	—	—	—	—	109,912	406,208
1900	3,721	14,494	—	—	—	17,526	97,727	371,920
1901	4,918	16,613	—	—	1,410	11,357	134,719	468,606
1902	7,231	24,878	—	—	2,680	19,740	136,937	388,162
1903	8,650	28,650	7,086	804	211	1,267	129,812	417,116
1904	17,897	76,025	—	—	—	—	125,560	382,356
1905	10,983	45,853	—	—	—	—	130,959	426,511
1906	8,037	27,000	801	104	—	—	164,160	718,609
1907	5,609	20,540	5,845	780	1,000	11,000	158,620	690,000
Totals	—	280,311	—	1,688	—	61,840	—	4,514,353

Year.	Copper Ore and Regulus.		Lead.		Ironstone Flux.		Limestone Flux.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Cwts.	£	Tons.	£	Tons.	£
1898	536	3,992	6,316	3,806	—	—	—	—
1899	2,892	24,682	7,282	3,782	—	—	—	—
1900	2,367	22,526	7,650	4,362	—	—	—	—
1901	1,866	23,011	1,360	722	—	—	—	—
1902	2,579	42,550	43,507	22,303	—	—	—	—
1903	7,069	54,922	14,408	8,799	84,932	46,712	—	—
1904	3,051	24,597	—	—	46,687	27,091	43,440	6,516
1905	2,563	28,434	1,040	369	84,483	48,577	44,498	4,791
1906	—	—	1,000	550	75,226	33,852	31,940	4,791
1907	—	—	—	—	84,600	38,100	31,100	5,800
Totals	—	224,715	—	44,713	—	194,332	—	21,898

Year.	Phosphate Rock.		Crude Salt.		Other Metals and Minerals.	Total Value.
	Quantity.	Value.	Quantity.	Value.		
	Tons.	£	Tons.	£	£	£
1898	—	—	—	—	560	264,849
1899	—	—	—	—	1,357	451,611
1900	—	—	—	—	411	431,259
1901	—	—	—	—	2,219	522,478
1902	—	—	—	—	742	498,375
1903	1,000	1,000	40,000	12,000	100	571,371
1904	3,000	3,000	40,000	12,000	198	531,783
1905	5,000	5,000	32,500	13,000	1,261	573,796
1906	5,850	5,850	55,000	27,500	2,209	820,465
1907	8,000	8,000	75,000	37,500	2,500	814,220
Totals	—	22,850	—	102,000	11,507	5,490,007



(Pl. xxii.)

ENGINEERING SHOP STATE LOCOMOTIVE WORKS AT ISLINGTON.

CHAPTER XXII.

MANUFACTURES.



ALTHOUGH essentially a country of primary production, the conversion of raw material into commercial articles received early attention. For some time secondary production was mainly in the direction of providing agricultural implements and commodities required by those who were engaged in occupying the country. As conditions became more settled industries increased in number and variety, and now that Federation has given inter-State free trade manufacturers are looking forward to growing markets throughout the Commonwealth. The discovery of silver in the western districts of New South Wales and the opening up of some of the richest silver-lead mines in the world proved a great boon to South Australian manufacturers. Engineering firms and boilermakers received large orders, and, by the excellence of their work, have retained valuable connections with Western Australia. The following are the published returns of manufactories and the hands employed :—

Year.	Establishments.	Males.	Females.	Total Hands Employed.	Year.	Establishments.	Males.	Females.	Total Hands Employed.
1885 ..	646	7,952	1,350	9,302	1899 ..	841	12,941	2,214	15,155
1892 ..	815	9,642	1,847	11,489	1900 ..	1,036	14,800	2,859	17,659
1896 ..	767	10,974	1,811	12,785	1907 ..	1,018	16,466	3,800	20,266

As the production of grain increased flour mills were started in the city and at Port Adelaide, and the manufacture of breadstuffs became an established industry. At the present time there are 63 flour mills in various parts of the State, and the South Australian article finds a ready demand throughout South Australia, South Africa, and Java. Factories devoted to metal works and machinery number 132, employing 6,793 hands; chaff-cutting 76, with 469 employés; boots and shoes 17, 1,212; tanneries 12, 282; brickmaking 36, 276 hands; coachbuilding 46, 464; aerated waters 31, 246; breweries 20, 297; distilleries 13, 62; clothing 131, 4,048; cabinetmakers 23, 377; printers and bookbinders 41, 1,366; butter and cheese 55, 137; chemical works 4, 188; basket and brushware 7, 130; and sawmills 25, with 457 hands.

Extensive locomotive shops have been established by the Government near Adelaide, where most of the locomotives required by the railways are made, and where railway repair work is attended to. These shops are well equipped with machinery. Locomotives have also been built at Gawler. The Government has erected a plant at Port Adelaide for the making of cast-iron pipes for water reticulation purposes.

South Australia has always been noted for the excellent quality of its flour, and some of the finest flour mills in the Commonwealth are to be seen in this State. South Australian flour is shipped in large quantities to London, South Africa, Java, Singapore, and Australian States. Another important branch of manufacture is that devoted to the making of agricultural implements. There are also a number of bark mills and tanneries, where the best leather to be found in the world is made. Salt works do a large business in refining the raw material taken from salt lagoons, and a big trade has been built up throughout Australia. Not the least interesting "industry" for which the State is famed is the Cement Works near Brighton, where an excellent quality of cement is manufactured. The cement finds a ready sale throughout the Commonwealth, having satisfactorily passed the severest official tests. The largest tinware factory

"south of the line" is to be found in Adelaide, while furniture-making is carried on to a large extent. A winding engine for mining purposes, recently manufactured by a South Australian engineering firm for Broken Hill, is credited with having a world's record for hauling power.

Factory Legislation. Legislation affecting factories was passed during the Parliamentary session of 1907, under which boards have been created in respect to certain trades for the regulation of wages. There is inspection and supervision by Government inspectors. The principle of the eight hours system is in general operation throughout South Australia.

A Chamber of Manufactures. Considerable assistance has been given to manufacturers by an active organisation which holds exhibitions and in other ways promotes the interests of factory-owners. The South Australian Chamber of Manufactures is the oldest institution of its kind in Australia. It was established in 1869, and has steadily progressed with the growth of the State; in fact, it claims that in many directions the progress made has been due to the untiring efforts of its members. By means of free public lectures, practical demonstrations, and hundreds of thousands of pamphlets the public has had the opportunity of being informed and instructed by the best recognised authorities on a variety of subjects. No new invention of importance is launched without being brought under the notice of members. Parliamentary Bills and methods of administration affecting manufacturers and producers are constantly being placed before those directly interested, and many valuable suggestions emanating from the Chamber have reached and been given effect to by the powers that be. Periodically the Chamber holds exhibitions, the educational and practical advantages of which it is impossible to adequately gauge. The objects of the Chamber are—"To promote the development of South Australian manufactures and products, and in furtherance of such objects (a) to hold meetings at which lectures may be delivered, papers read, and, discussed, and, where deemed of sufficient value, published for distribution amongst members; (b) to hold exhibitions for the display of manufactures and products, and such of the arts as may be deemed advisable; (c) to offer premiums or prizes for new inventions, and to encourage skill in connection with work appertaining to the objects of the Chamber; (d) to establish a library and industrial museum, accessible to the members of the Chamber; (e) to closely watch all legislation and decisions of the courts on matters affecting the objects of the Chamber, and to take such action as may be deemed necessary.

Work and Wages. Federation has emphasized the importance of the manufacturing industry of the State. With the abolition of border duties not only has a wider inter-State market been made available to South Australian makers of the finished product, but in addition they have been brought into closer contact with Australian competitors in the local market. In both ways the goods of this State have had to bear comparison and withstand competition, which are at the same time broader and keener than before union. This has caused manufacturers to look to their laurels, and results have shown that South Australian factory-owners are more than holding their own. The workshops of the Central State are gradually assuming larger proportions, and there are not wanting signs that a steady expansion is taking place. The demand for skilled and other labor is largely governed by the seasons and the state of trade, and it fluctuates from one year to another. At the present time it is generally admitted that there is a "good demand" for labor all round; but a statement of this kind made in all good faith one year may not stand for the whole twelvemonth. With this qualification it may with safety be asserted that for rural workers and artisans there is a fair opening in South Australia. Farmers are paying ploughmen from 17s. 6d. to £1 per week and their keep. There has been a demand for labor in the furniture-making trade, in which the ruling rates of wages have been—Cabinet-makers, from £2 11s. to £3 12s. for a week of 48 hours; machinists, 35s. to £3; turners, 30s. to £3; general hands, 30s. to 50s. "There is plenty of room for top workmen" was the response to the inquiry concerning the demand for workmen in the building trade. Masons, plasterers, painters, and carpenters have been kept fully employed for some time past, the ruling rates of wages having been—Masons and bricklayers, 1s. 4½d. an hour; carpenters

and joiners, 1s. 3d.; builders' laborers, 1s.; plumbers and plasterers, 10s. a day; and painters 8s. to 10s. In the boot trade the factories have been running at full time. The Wages Board has fixed a minimum rate of pay for machinists at £2 5s. per week; skilled operators up to £3 and £4. There has been a demand for good mechanics in all branches of trade devoted to engineering and the making of agricultural implements. The following minimum rates of wages were agreed to at a conference between representatives of employers and workmen at the deputation room, Victoria Square, Adelaide, on June 4th, 5th, and 6th, 1907:—1. Standard—Per day of eight hours—Patternmakers, average capacity, 11s.; patternmakers, under average capacity, 10s.; blacksmiths and fitters, average capacity, 9s.; combmakers, turners, machinists (iron), working milling machines, slow, less than average capacity, 8s.; machinists (iron), working planing machines, 8s.; carpenters, average capacity, 10s.; carpenters, slow, under average capacity, 9s. Woodworkers—Tradesmen, average capacity, 9s.; tradesmen, slow, under average capacity, 8s.; not tradesmen, average capacity, 8s.; not tradesmen, slow, under average capacity, 7s. 6d.; machinists (wood), 8s.; wheelwrights, 9s.; decorators



Adelaide Chemical and Fertilizers Co., Ltd., New Thebarton, Works, ground space of which covers 234,660 square feet.

(defined as painters, doing scroll work and writing), 10s.; painters, qualified, 8s.; moulders, average capacity, 9s. 6d.; moulders, under average capacity, 9s.; coremakers, when not apprentices to be classed as moulders; furnacemen (cupola), 8s. Sheet iron workers—If tin-smiths or qualified tradesmen of average capacity, 9s.; same, slow, under average capacity, 8s.; sheet iron workers, not qualified tradesmen, 7s. 6d.; drill men, strikers, and fettlers, 7s. 6d.; laborers (1) used to trade, 7s. 6d.; laborers (2), not used to trade, 6s. 6d.; steam engine drivers, 7s. 6d.

Apprentices or learners—First year, 7s. 6d. per week; second year, 10s.; third year, 12s. 6d.; fourth year, 17s. 6d.; fifth year, 22s. 6d. To come into operation at once.

Youth laborers—Fifteen to 16 years, 10s. per week; 16 to 17 years, 13s.; 17 to 18 years, 16s.; 18 to 19 years, 20s.; 19 to 20 years, 25s.; 20 to 21 years, 30s.

With regard to aged and infirm men proposed to be employed at less than the standard wage, the masters shall not engage such men at a wage less than in each particular case shall be agreed between the master and the representatives of his employes elected from among themselves by the employes over 21 years of age as follows:—Where there are 25 such employes or under, one representative to be elected; where over 25 and not exceeding 50 such employes, two representatives to be elected; and where over 50 such employes, four representatives to be elected.

For two years after the expiry of the five years' term of apprenticeship a man may be deemed an improver, and for improvers the rate of pay may be 1s. 6d. per day less than the rate fixed as the standard minimum for the particular class of work.

The rates of wages shall be on the basis of 48 hours per week. Overtime—Outside usual hours, time and an eighth; holidays, time and a quarter.

The following is an official return supplied to Parliament showing the rates of pay and class of work paid for skilled, partially skilled, and unskilled labor at the Islington State Locomotive Workshops:—

								Minimum Per Day.		Maximum Per Day.
								s. d.	s. d.	s. d.
SKILLED LABOR—										
Apprentices .. .. .	..	..	..	..	..	..	..	1 0	—	3 6
Blacksmiths .. .. .	..	..	..	..	..	..	..	9 0	—	11 6
Boilermakers .. .. .	..	..	..	..	..	..	..	7 6	—	10 6
“ leading .. .. .	..	..	..	..	..	..	..	10 6	—	12 0
Brassfinishers .. .. .	..	..	..	..	..	..	..	8 6	—	10 0
Carpenters .. .. .	..	..	..	..	..	..	..	8 0	—	9 6
“ leading .. .. .	..	..	..	..	..	..	..	9 0	—	12 6
Carriage-builders .. .. .	..	..	..	..	..	..	..	8 0	—	10 0
“ leading .. .. .	..	..	..	..	..	..	..	10 6	—	14 0
Carriage-trimmers .. .. .	..	..	..	..	..	..	..	8 0	—	10 0
Coppersmiths .. .. .	..	..	..	..	..	..	..	9 0	—	9 6
Fitters .. .. .	..	..	..	..	..	..	..	7 6	—	11 0
“ brake .. .. .	..	..	..	..	..	..	..	9 6	—	12 0
“ leading .. .. .	..	..	..	..	..	..	..	10 6	—	12 6
“ in charge .. .. .	..	..	..	..	..	..	..	12 6	—	14 0
Foremen, under .. .. .	..	..	..	..	..	..	..	—	14 0	—
Frenchpolishers .. .. .	..	..	..	..	..	..	..	8 0	—	9 0
Moulders .. .. .	..	..	..	..	..	..	..	7 6	—	10 6
Painters .. .. .	..	..	..	..	..	..	..	8 0	—	10 0
“ leading .. .. .	..	..	..	..	..	..	..	—	10 0	—
Patternmakers .. .. .	..	..	..	..	..	..	..	9 0	—	10 0
Tinsmiths .. .. .	..	..	..	..	..	..	..	8 0	—	9 6
Turners .. .. .	..	..	..	..	..	..	..	7 6	—	10 6
“ wheel .. .. .	..	..	..	..	..	..	..	7 0	—	9 6
Wagon-builders .. .. .	..	..	..	..	..	..	..	8 6	—	9 0
PARTIALLY SKILLED LABOR—										
Boilermakers' assistants .. .. .	..	..	..	..	..	..	..	7 0	—	8 0
Drillers .. .. .	..	..	..	..	..	..	..	7 0	—	7 6
Lifters .. .. .	..	..	..	..	..	..	..	7 0	—	7 6
“ leading .. .. .	..	..	..	..	..	..	..	—	9 0	—
Machinists .. .. .	..	..	..	..	..	..	..	7 0	—	9 0
“ wood .. .. .	..	..	..	..	..	..	..	7 0	—	9 0
Painters, rough .. .. .	..	..	..	..	..	..	..	—	7 0	—
Strikers .. .. .	..	..	..	..	..	..	..	7 0	—	7 6
UNSKILLED LABOR—										
Laborer, foreman .. .. .	..	..	..	..	..	..	..	—	9 6	—
“ leading .. .. .	..	..	..	..	..	..	..	—	8 0	—
Laborers, adult .. .. .	..	..	..	..	..	..	..	—	7 0	—
“ youth .. .. .	..	..	..	..	..	..	..	1 6	—	5 0

The following are the current rate of wages in Adelaide for tradesmen. The quotations represent a fair average for skilled hands working at the rate of 48 hours a week:—Bakers, per week (minimum), £2 10s.; blacksmiths, per hour, 1s. 1½d. to 1s. 3d.; boilermakers, per hour, 1s. 1½d. to 1s. 4½d.; bootmakers (male), per week, from 45s. to 75s.; brassmoulders and finishers, per hour, 11d. to 1s.; brickmakers, per hour, 1s. 4½d.; butchers (minimum), per week, £2 10s.; cabinetmakers (minimum) per week, £2 11s.; carpenters and joiners, per hour, 1s. 3d.; carriage-building (all branches), per hour, 1s. 1½d. to 1s. 3d.; coopers, per hour,

1s. 1½d. to 1s. 3d.; coppersmiths, per hour, 1s. to 1s. 3d.; dressmakers (minimum), per week, 16s.; fitters and turners (engineering), per hour, 1s. 1½d. to 1s. 4½d.; galvanized iron workers (indoor), per hour, 11d. to 1s.; ironmoulders, per hour, 1s. 1½d. to 1s. 4½d.; masons, per hour, 1s. 4½d.; painters and paperhangers, per hour, 1s. to 1s. 1½d.; patternmakers, per hour, 1s. 4½d.; plasterers, 1s. 3d.; plumbers, 1s. 3d.; polishers from 1s.; saddlers, 1s. to 1s. 3d.; stonecutters, 1s. 4½d.; tailoring (female), per week, from 18s. to 36s.; tinsmiths, per hour (minimum), 11d.; upholsterers, per hour, from 1s.; wheelwrights, per hour, 1s. 3d.; woodturners, from 1s.

Cost of Living. Equally important to the rate of wages is that of the cost of living to the wage-earner. A high scale of wages may be made to look alluring, but if, in order to earn them, the worker has to pay high rents and purchase the necessities of life at enhanced rates, his net income may easily be reduced to

vanishing point. With the qualification that the prices of food supplies are subject to more or less fluctuations owing to the seasons, which regulate the supply, the following quotations of commodities are given as they were on a recent date:—Bread, per 2lb. loaf, 3d.; butter, factory, per pound, 1s. 1d.; jam, first grade, per tin, 8½d.; flour, 25lbs., 2s. 9d.; oatmeal, 7lbs., 1s. 3d.; eggs, per dozen, 8d.; tea, average, per pound, 1s. 3d.; coffee, first grade, per pound, 1s. 9d.; sugar, per pound, 2½d.; kerosine, per tin, 3s. 6d.; bacon, per pound, 9½d.; soap, first grade, per pound, 8d.; sago, per pound, 4d.; candles, per pound, 8d.; milk, per quart, 4d.; coal, per ½ton, 7s. 6d.; beef, rump steak, per pound, 8d.; corned beef, round, per pound, 5d.; mutton, hindquarter, per pound, 4½d.; pork, per pound, 7d.; sausages, beef, per pound, 4d.; tripe, per pound, 6d.; potatoes, per 14lbs., 3s. 3d.; onions, per pound, 3d.; boots, size 8, Hungarian nails, 9s. 6d.; cod, 2lbs., 1s. 8d.

Penny sections prevail on city and suburban tramways and cheap fares are available on suburban railways.

Rents. The following are the rents of houses let to workmen within a two-mile radius of the post office:—Four rooms, per week, 9s.; five rooms, per week 12s.; six rooms, per week, 15s.; seven rooms, per week, 20s.

Good Country for Good Workmen.

The President of the Federal Council of Chambers of Manufactures of Australia, when asked "What are the conditions of the working classes in Australia as regards remuneration and living?" replied that he agreed with a correspondent of his who wrote—"The conditions of the working classes are good, and the wages paid compare favorably with any other country in the world, the hours of labor being limited to the popular rate of eight hours per diem. The cost of living is as cheap, if not cheaper, than that prevailing in other places, while the rents are normal. They can get good, wholesome food at bedrock prices. From my knowledge of mechanics I believe that their remuneration and living are such that they can enjoy life and make due provision for old age."

"For Our Country." On a recent occasion the Chamber of Manufactures arranged for a "Manufacturers' Day," when throughout the city and suburbs there was a splendid display of articles made in Australia. About 200 merchants and shopkeepers dressed their windows, and a creditable exhibition was provided. This served to bring forcefully before the general public the great advances made in manufactures during recent years.



FISHERIES.

SOUTH Australia has over 2,000 miles of coastline, with innumerable inlets favorable for the feeding and breeding of fish, and many of them eminently suitable as working bases for fishermen. The temperatures of the coastal waters and general conditions are conducive to healthy fish life, and, though the industry has so far been most sadly neglected, there is every reason to believe that those varieties of fish which flourish in the same latitudes elsewhere abound here. Mark the unqualified opinion of that experienced traveller Frank T. Bullen, who, in his work, "Our Heritage—The Sea," penned the following paragraph:—"Australia! How can I do justice to the plenitude and amiability of your splendid fish? Everywhere I have sailed or steamed around the shores of that noble country in or out of harbor, the story is the same—the most marvellous assortment of fish, easy to be caught, and of most delicious flavor. I consider that Australia's fisheries are most unaccountably neglected, even when it is remembered how plentiful, good, and cheap are all kinds of other food. What fishing there is has fallen mostly into the hands of industrious foreigners. . . . Our kindred in Australia do not care to engage in any work that involves long and irregular hours, and also precarious gains; or if driven by any pressure of circumstances to engage in such employment, they always relinquish it as early as possible. Nature has been exceedingly kind to Australia in many ways; but in none more than in the matter of food to be obtained from the sea." South Australia is undoubtedly rich in the possession of fishing grounds, and its greatest need is an experienced and industrious population which will cast net and line for a living, and gather this harvest which experts affirm is fully developed, and only awaits reapers. Of the inland waters the River Murray and its lakes and billabongs are the best for fish, and they abound with them. The famous Murray cod is in demand throughout Australia. About 300 tons of fish are sent annually to the markets of other States. Perch do well in the Onkaparinga and other rivers, and some rainbow trout placed in various waters throughout the State are increasing. Fish also thrive in the reservoirs, and as these become spread over the country so will a means of increasing the fish supply be provided. The possibilities of the fish industry in this State are considerable, and there should be no difficulty in promoting fisheries, thus finding profitable employment for thousands of men with their wives and families.

Expanding the Industry.

At present there are about 400 licensed men who depend upon fishing for a livelihood, but this number could be greatly increased by a systematic exploitation of our coastal waters. Scientific research is essential in order to accurately chart the spawning grounds and ascertain the habits and migrations of edible fish, and the basis for this is being prepared in the form of a catalogue of the various species which frequent these waters, the compilation of which is now well in hand. About 2,000 tons of fish are now annually taken from our waters, of which 250 tons come from the Murray, while South Australia imports £40,000 worth of preserved fish every year. With the industry properly established in the hands of men skilled in drying fish this State should be an exporter. It is recognised that concurrently with increasing supplies greater facilities must be provided for marketing and delivering to consumers. There is no reason why fish fresh from the sea should not be at the consumer's door with the milk on the morning after being caught. South Australians are not large consumers of fish—partly because of the dearness, and also for the reason that there is no regular delivery to private houses. Enterprising persons who would receive fish on arrival of the trains from seaports, place it direct into cool chambers, and deliver to customers early next morning would so establish a large connection. In that way a regular trade would soon be built up and the industry gradually expanded.



(CH. XXIII.)

FISHERMAN'S CAMP ON THE RIVER MURRAY.

Inquiries from Scotland.

Fishermen delegated by those engaged in the industry in Scotland visited various fishing places off our coast during September, 1908, and expressed themselves favorably impressed with the harbor and transport facilities, as well as the prospects of establishing a lucrative fishing industry combined with by-product manufactures. "South Australia wants only men and boats to work its fisheries" was their conclusion. The Government intended to offer facilities to fishermen from across the sea to settle in this State, and to establish drying and preserving grounds, and for residential sites. The delegates stated that if sufficient inducement offered a large number would be prepared to emigrate. They said South Australia alone could do with 5,000 British fishermen.



Preparing Fish for the Adelaide Market.—Cleaning Murray River Cod near Renmark.

Helping the Industry.

This State has not yet reared fish artificially, but the question of establishing a floating hatchery for the Murray waters is under consideration. Much has been done to protect the supposed spawning grounds in various parts of the State, to secure natural replenishment of our fish supply, and the destruction in three years of 30,066 cormorants and 90,067 turtles must naturally help to keep up supplies. Each shag is believed to devour over 2lbs. daily, and the turtle's capacity for spawn is enormous. The establishment of hatcheries is generally advocated by our fishermen, but the expense of separate establishments is not warranted if the subject be dealt with federally and supplies drawn from the Sydney hatcheries. It is expected that the expert who was instrumental in getting the Prospect and Port Hacking hatcheries, and who is now the Federal officer of fisheries, will advise federally and enable this and other States to procure fresh stock for our waters in the most approved manner.

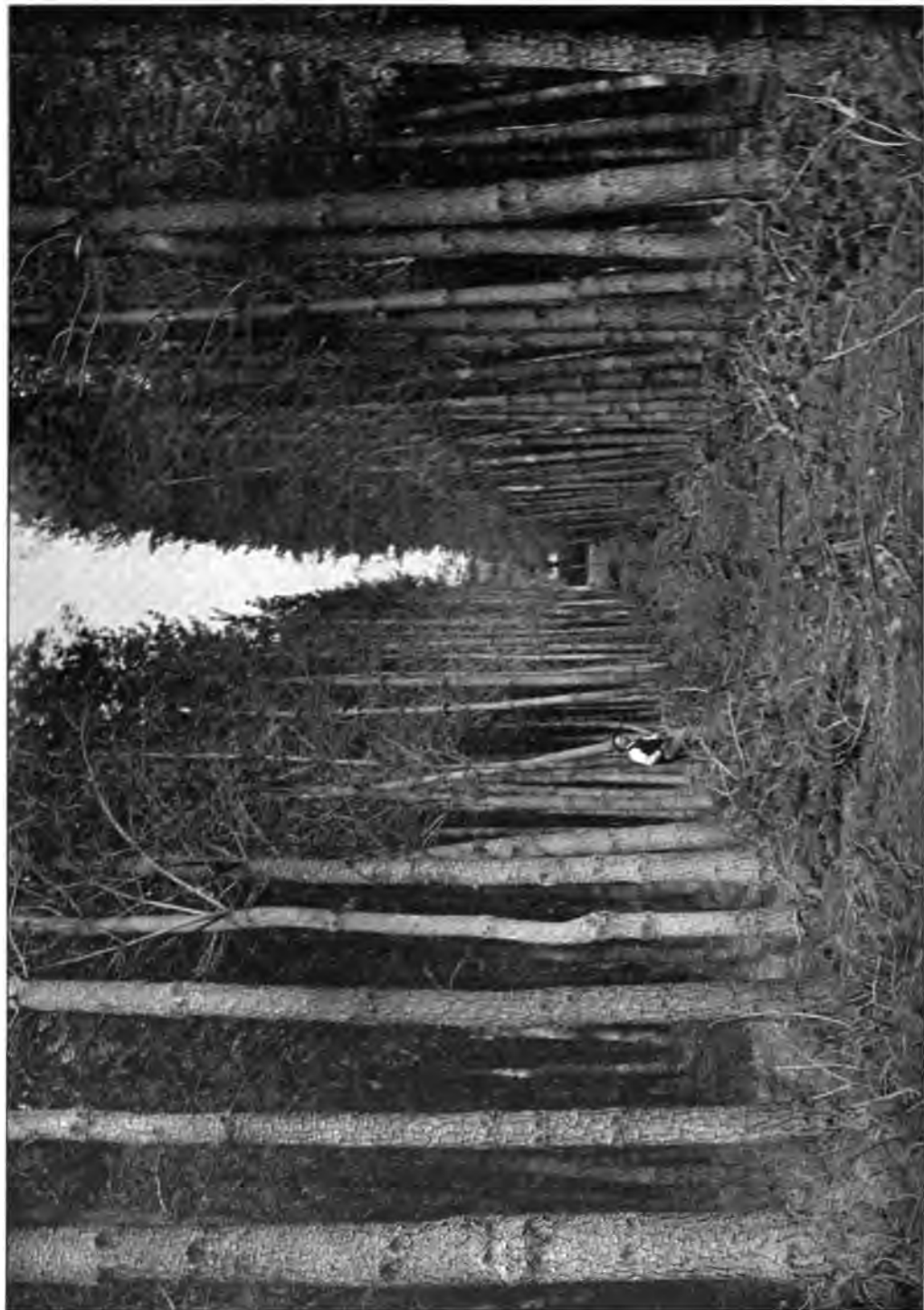
Varieties. Among the varieties of fish to be found in South Australian waters may be mentioned schnapper, whiting, garfish, salmon, mullet, tommy rough, barracouta, flying gurnard, snook, flatheads, flounders, crays, cod, and bream.

**Fisheries
Legislation.**

The action taken under existing fisheries laws is as follows:—Inspectors have been appointed, including every member of the police. These officers are empowered to issue fishermen's licences, to certify to the destruction of cormorants and turtles, to apprehend persons infringing any of the provisions of the Act, to enter any fishshop and destroy fish unfit for food, to enter any fishing boat, examine nets, and enforce the provisions of the Acts. Regulations have been made prescribing certain description of nets for specified waters, providing for measurement of nets and how they are to be used, to prevent taking of underweight fish, and requiring them to be returned to the water. To prevent the use of explosives and wire-netted pounds. Close seasons have been proclaimed, and the use of nets has been prohibited in various waters throughout the State for the protection of fish during spawning season. Other powers given by the Act for the furtherance of the industry will be brought into operation as occasion requires. Fishing is a vocation that cannot be always under the eye of the inspectors, and the department look confidently to *bona fide* fishermen to shield the industry from exploitation by unlicensed or unscrupulous persons. The object of the law and the desire of the department is to protect and further the industry in the interest of the fishermen whose living it is so long as they ply their trade honestly and with due regard to preserving the permanence of the industry. It is important to fishermen to have supplies preserved, and equally important to the consumer to have ample quantities of this popular article of diet at reasonable prices. Not until scientific investigation has solved many of the problems common to all fisheries can legislation be placed on a thoroughly satisfactory footing.



Favorite Spot for Picnic Parties on the Hindmarsh River.



CHAPTER XXIV.

FORESTRY.

SOUTH Australia, as in so many other movements, was the first State of the Australian group to establish State forests. Early settlers were permitted to draw upon the supplies of native timber without restriction until it became apparent that the limited extent of natural forests would soon become exhausted. In 1870 Mr. F. E. H. W. Krichauff persuaded the House of Assembly, of which he was then a member, to call for reports on the best size of reserves for forest purposes, where they should be made, the best and most economical means of preserving the native timber on them, and of planting and replanting the reserves as permanent State forests. Three years later the Forest Act became law, and a bonus was offered of £2 per acre of land on which forest trees were planted and maintained for a period of five years. The practical results of this proved disappointing, for little or no effort was made by private landowners to earn the subsidy. The State forest system was inaugurated in 1875, when the Forest Board was appointed, and 195,398 acres were set apart for tree-planting and conservation of the indigenous timber by natural regeneration where desirable. This board was subsequently abolished by the Woods and Forests Act, 252/1882, and the Woods and Forests Department was created in its place, with a Conservator of Forests at its head, under the control of the Commissioner of Crown Lands, as a body corporate under the name and style of "The Commissioner of Forests." Ultimately this area was increased until the first reserves comprised 239,336 acres. Alienations for perpetual leases have reduced the territory under the supervision of the Woods and Forests Department to about 164,113 acres.

Distribution of Trees.

For the whole 31 years of the forests' history the expenditure has been £198,987, and the revenue £155,793. In only seven out of the 31 years has the revenue exceeded the expenditure. The best results were in 1887-8, when the receipts amounted to £12,080, and the expenditure to £7,262. In considering this aspect of the question it must be remembered that one prominent feature of the department's work has been the distribution *gratis* of forest trees for 26 years, during which period over 7,000,000 trees have been issued to corporations, district councils, and other public bodies, and to farmers and others in the State for the purpose of beautifying their residences, providing shelter for stock, and ornamenting the various towns. A fair measure of success has been attained in this way, and the beneficial effects produced—especially in the originally treeless districts—have been considerable. As no charge has ever been made for the trees, and the cost of production has been very considerable, the discrepancy between the revenue and expenditure previously alluded to can be easily understood, and it will readily be seen that if a fair value had been assigned for the trees year after year, and the amount passed to the credit of the Department, the financial position would have been very materially altered. Reckoning the value of 7,000,000 trees at 2d. per tree the result is £58,333. The last year's returns show the expenditure as £198,987 and the revenue as £155,793; but had the value for the trees been credited as indicated the position would have been reversed, and a credit of £15,139 would have been shown to the department.

Forests of Pines.

The present Conservator of Forests (Mr. Walter Gill) was appointed in 1890, and he has done excellent work with the limited funds at his command. People and Parliament of South Australia have been singularly apathetic in the matter of afforestation, and the pruning knife of economy has more than once been applied to this department. In all the South Australian forests 1,100

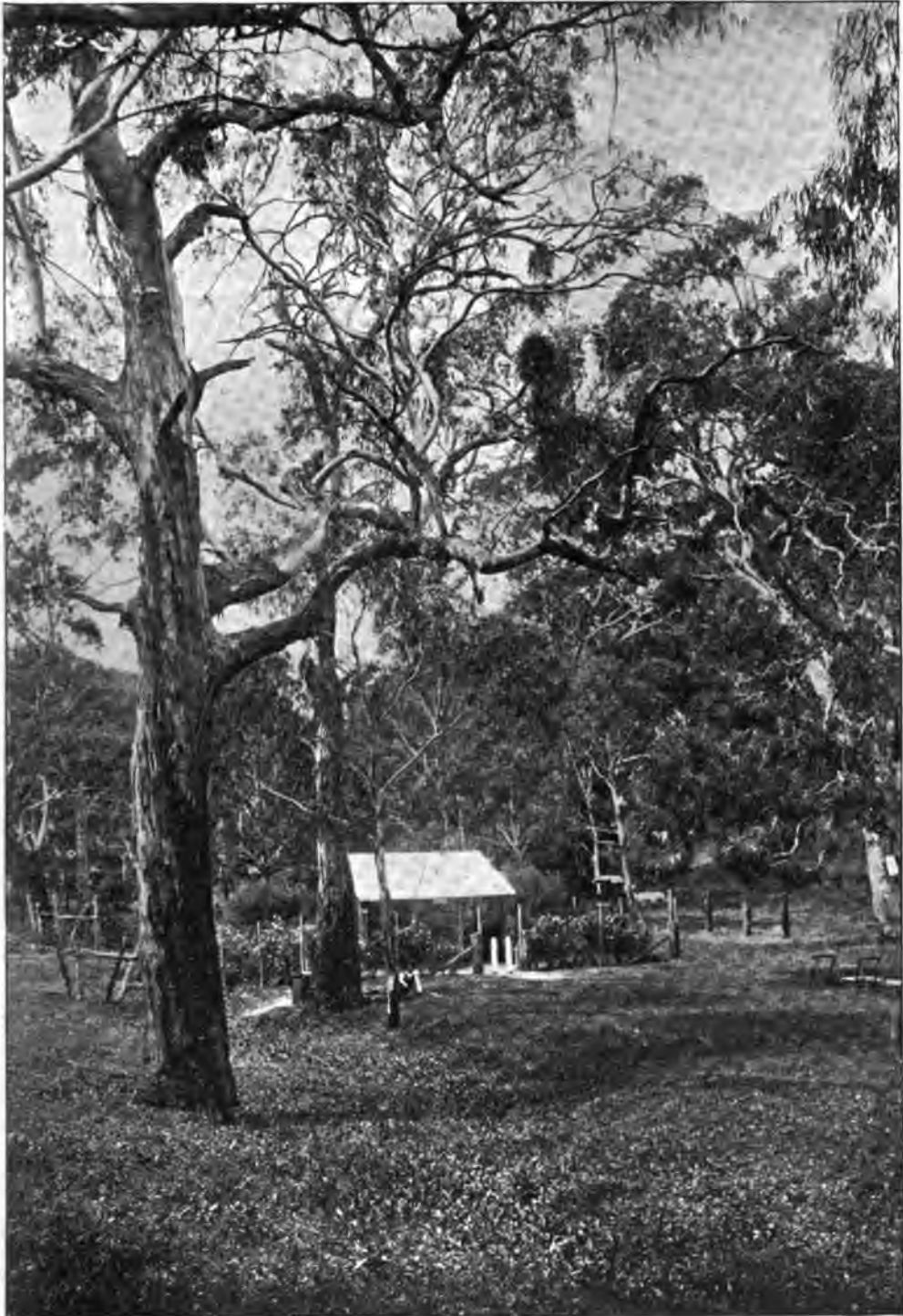
acres of pines have been planted, and over half of this area is represented at Wirrabara, where the trees vary in age from 1 to 25 years. To-day 85 per cent. of the world's timber demand is for pine, and the amount which goes out of South Australia for this useful class of timber is between £100,000 and £200,000 every year. The world's newspaper press alone devours many millions of tons a year for its pulp paper, and in all countries supplies are rapidly being depleted. The Conservator is an extremely cautious man, but after many anxious years he has thoroughly satisfied himself that pines which are suitable to local conditions can be grown in South Australia without risk and with great profit. The pines which have proved most suitable for general culture are the Remarkable or Monterey pine (*Pinus insignis*), the Aleppo pine (*Pinus halepensis*), the Stone pine (*Pinus pinea*), the Maritime pine (*Pinus maritima*). The most rapid grower and most profitable tree, when planted under suitable conditions, is the Remarkable pine, a native of California. This was first introduced into this State by the late



View in Pine Plantations, White Park, Wirrabara (State) Forest.

[W. Gill, Photo.]

distinguished botanist, Baron Sir F. von Mueller, in 1859, on which occasion he sent some plants to the Botanic Garden of Adelaide in the time of the late Mr. Francis. Speaking of this pine the Conservator says—"Strong views have frequently been advanced against this pine, in most cases by those who were practically unacquainted with its nature and behavior under systematic culture, and judged it either by hearsay or from ornamental specimens they had seen. The Forest Department, having fully tested it for a series of years, is able to prove beyond doubt its special excellence for box lumber, and its general utility for wagon and dray bottoms and sides, ladders, barrows, rafters, planking, flooring boards, and other purposes; but any special pleading in its favor is rendered unnecessary in the present instance because, in districts where once it was condemned untried, those falling into that error are now convinced of its value, and are anxious to obtain cases when available; and when the purchaser is satisfied mere theoretical discussion is useless. Calculating the areas of Remarkable pine by themselves, we find the average annual growth or increment per acre to amount to 100 cub. ft.;



View in National Park, the People's Playground, showing Giant Gums and Natural Forest.

[J. Marshall, Photo.]

but when the other pines, Aleppo and Maritime, are averaged with it, the annual acre increment falls to 80 cub. ft. : as, though the Aleppo and Maritime give valuable results, their growth is not so rapid as the Remarkable pine, nor do they give so large a yield per acre. When, however, it can be plainly demonstrated that averaging the three pines indicated—after thoroughly testing them—the yield per acre even at such an early stage of growth as 25 years comes out at 80 cub. ft., or 960 (nearly 1,000) super. feet per annum (excluding branch and top wood), the department feels justified in claiming that the question ‘Can South Australia grow any pine timber?’ has been answered in the affirmative.”

Suitability of Soil and Climate. On the question of the character of climate and soil for the growing of timber the Conservator further remarks—“There are thousands of acres in the State suitable for pine-growing now carrying inferior timber of practically no value or scrubby vegetation. The cost of clearing, fencing, and planting varies according to circumstances ; but, speaking broadly, a



Tree-planting, Bundaleer Forest Reserve.

[W. Gill, Photo]

plantation of pines may be established under suitable conditions, and maintained till it represents the gross value already indicated of £200 per acre, at a cost varying from £5 under the most favorable conditions to £10 per acre where more work is needed to prepare each acre for planting. The ultimate return to the revenue shown as probable from the estimates given is surely in itself a highly satisfactory one ; but there are other aspects of the matter quite as important as the revenue one. The German forests, which are rightly regarded as of incalculable value to the State, support directly 1,000,000 people in employment ; while another 3,000,000 are maintained by industries connected with them. Making and maintaining forests means that men must be employed to do it. It will pay well, given the requisite time and patience for development. It will pay in revenue ; but it will pay better in the healthy, strong men it rears amidst healthy forest conditions, in the increase of the producing power of the country,

and in assisting to prevent the congestion of our population in our cities. The Maritime pine forests in the south-west of France now cover 300,000 acres of what was once waste, useless land, and support a considerable population employed in producing turpentine and its by-products from trees that afterwards yield large quantities of lumber for the boxes required in the onion and orange export trade of Spain."

Praise from a Visiting Expert. The pine plantations established by the department were the subject of very favorable comment on the occasion of a visit made with the Conservator in February last by Mr. E. O. Faulkner, the manager of the tie and timber department of the Atchison Topeka and Santa Fé Railway, one of the largest American systems. Speaking to a representative



Fruit Cases Made from Remarkable Pine Grown at Wirrabara Forest.

[W. Gill, Photo.]

of one of the leading papers he said—"The pine plantations, I understand, are giving excellent financial results after 25 years, which is much better than we can do in America, although the trees are indigenous to our soil. I saw pine trees from 11in to 14in. in diameter in less than 25 years which would do credit to any country."

Fruit Cases from Locally Grown Timber. Since the industry of case-making was first started in the Wirrabara Forest 41,121 cases of various kinds—mainly apple export, raisin, and apricot—have already been sold, resulting in a substantial increase to the revenue. It is interesting to note that some of the apples which brought the highest prices in Berlin within the last year or two were carried in cases made by the department in the Wirrabara Forest.

Hardwoods. Turning to the Eucalypts, or hardwoods, results are not so rapid as with the pines, as, owing to the purposes for which they are required, they must generally attain a greater maturity ere they can be utilised. From these, however, large quantities of useful material for general farming and estate requirements have been obtained from the thinnings, as well as a constant supply of firewood; but the main bulk of properly matured timber has yet to be realised. The extension of railways has created a large demand for redgum sleepers, and a large number of cutters are employed in various parts of the State under contracts to the Government. In view of the growing demands for commercial timbers the Government intend increasing the vote to the Forestry Department, in order that planting operations should be extended.



Load of 2,500 Fruit Cases from the Wirrabara Forest for Renmark.

[W. Gill, Photo.]

Opinion of Members of a Royal Commission.

During last March the New South Wales Royal Commission on Forestry visited the Wirrabara and Bundaleer Forests. In giving an account of their work they stated that they visited these reserves in South Australia, between 30 and 40 miles from Port Pirie, and found "that splendid work had been done there under the direction of Mr. W. Gill (Conservator of Forests) in the propagation of exotic pines and various hardwoods. The most valuable pine in a commercial sense was found to be *Pinus insignis*, which has been planted about 25 years in these forests, and is now being cut to provide wood for fruit cases, &c. A small mill has been established at Wirrabara Forest, and an order for 25,000 fruit cases for the Renmark Irrigation Settlement is now being executed. Many exotic pines are making satisfactory growth, but the growth of the *Pinus insignis* is about twice as great as the volume of timber of any other pine. This experience was subsequently confirmed by the evidence taken at Ballarat and other centres in Victoria."

**Date
Plantations.**

Amongst other things the department has successfully proved that the date palm will produce excellent fruits in the dry Far Northern districts of the State. As in the case of many other fruits, variations in the seasons sometimes mar the quality; but for 15 years good dates have been grown in the plantations at Hergott and Lake Harry, the latter being the principal one, containing 2,193 palms. Though the quantity was not large, South Australia can claim to be the first State to produce and place on the market a good sample of merchantable dates, a quarter of a ton having been sold in Adelaide in 1906.



Deglet Nour (Date) Palm in Fruit, Lake Harry Reserve, South Australia.

[W. Gill, Photo.]

CHAPTER XXV.

WATER CONSERVATION AND IRRIGATION.

IN order to get close to the heart of Australia it is necessary to travel up the streams which spread themselves like veins in the human body across the eastern portion of the continent. The Murray is the main artery. With only two of its many tributaries, it is capable of being navigated for a distance equal to one and a half times across the Australian continent from south to north—from Adelaide to Port Darwin and half way back! An Australian unacquainted with these waterways is ignorant of the resources of his native land. For the last 500 miles of its course the Murray passes through South Australian territory. The importance of the favorable geographical position enjoyed by the "Central State" was realised by Captain Sturt and many pioneer settlers. One of them, writing in 1838, pointed out that "the farmer to the westward and northward of the Blue Mountains



Remark, on the River Murray.

[Frank Wyllie, Photo.]

and of the Australian Alps is, in fact, nearer to the markets of South Australia when 1,200 miles distant by water than he is to the port of Sydney when distant 300 miles by land." In 1851 Parliament offered a bonus of £4,000 to the person who would give a practical demonstration of the navigability of the Murray. The proof was supplied by Captain W. R. Randell and Captain Cadell in 1853, and for half a century the river has been a highway of trade.

An Extensive Watershed.

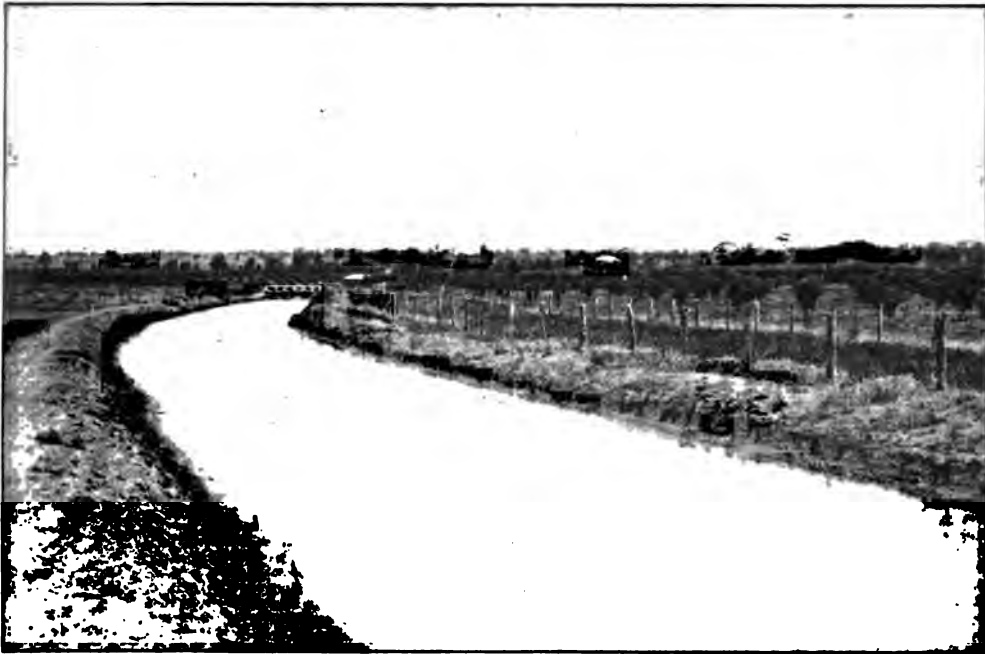
The Murray is the great natural main drainage line of the south-eastern part of Australia. The basin of the river and its tributaries comprises 414,253 square miles (265,121,920 acres)—an area double that of France—out of a total of 2,950,000 square miles in the whole Australian continent. The river basin includes within its limits nearly one-seventh of the entire mainland subject to the jurisdiction of the Commonwealth, being five-sixths of New South



THE RIVER MURRAY SHOWING RECLAIMED SWAMP LANDS WHICH CAN BE IRRIGATED BY GRAVITATION.
(Pl. xxv.)

Wales, considerably more than half of Victoria, over 100,000 square miles of Queensland, and 24,000 square miles of South Australia. The greatest height reached at any point on the boundary is in the south-east, where Kosciusko, the highest land in Australia, attains an altitude of 7,256ft. If to this vast catchment there be added the strip of coast land lying between it and the sea—from the Condamine River in the north-east to Lake Alexandrina in the south-west—the total would become one-fifth of the Australian continent, containing at least three-fourths of its entire present population, and much more than half of its agricultural and pastoral possibilities for the sustenance of human life.

Born on the snowclad heights of Kosciusko, cradled in rich glens, and fed by tributaries that rise in four States, the Murray moves leisurely and majestically to the sea. The river is one of the longest in the dominions of King Edward, with a watershed that has few rivals. To know Australia, to appreciate its magnificent resources, it is necessary to understand how the Murray and its sister streams can be made to serve the producer and the trader. These channels reach far towards the heart of the continent. They are gateways of trade to the interior



Irrigation Channels and Orchards at Renmark.

[Frank Wyllie, Photo.]

—great fertilising agencies, by means of which vast treasure caverns yet untouched may be unlocked. These waterways can be utilised as bearers of burdens as well as in the capacity of aids to production, and Australians will shortly enter upon the glorious inheritance represented in the Murray and its tributaries. Australia is looking to the valleys of its rivers for agricultural expansion. Where irrigation is possible there will be seen the best examples of intense culture, of "closer" settlement—that system of farming which was the salvation of France, and is still the hope of that country. Water is wealth. If rightly used, it will cause the desert to blossom and semi-arid lands to become fruitful.

The Future of the River Valley.

Early in 1905 a party of South Australian legislators travelled 550 miles up the Murray, and they realised more than many of them had ever done before that this stream is not only a highway of trade to inland Australia, but that its water may be made to unlock thousands of acres of semi-arid country. With a permanently navigable river the valley of the Murray is practically a land without limit. The scenery is often grand in its wild beauty; and the variety of game and of bird life, the giant gum trees, boxgum, and weeping

willows, through avenues of which the steamer threads its way, lend fresh charm to every bend and make an excursion most instructive and enjoyable. Thirty years ago two-fifths of the United States was regarded as a desert. One day a cowboy, breaking further away from civilisation than was usual, saw an alleged arid wilderness, and exclaimed—"This is no desert! This can be turned into pasture land!" and 30,000,000 cattle were soon grazing on the plains! A company of Mormons, possessing the faith and determination of a Moses, driven out into the desert, settled in the midst of it, and in a few years cities sprang up and green fields broke the monotony of long distances. The cactus had to give place to the fruit tree and the fodder plant. Water was the golden key which unlocked the lands of Western America. There is no reason why history should not be repeated in South Australia. The whole population of the State might be profitably employed in the valley of the Murray. Dr. Moorhouse, when Bishop of Melbourne, remarked—"The Murray is 10 times as long as the Thames, and is bound to play an important part in the development of this country. The people are missing the chance of maintaining an immense population, and of accumulating untold wealth, by letting



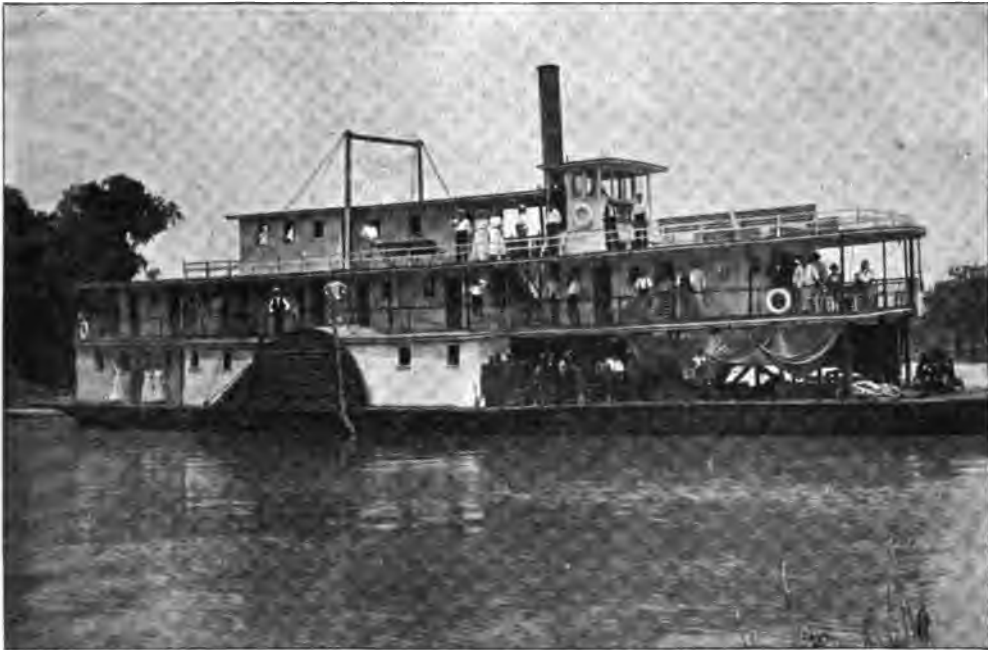
View on the River Murray, the "Nile" of Australia.

the waters of the Murray roll uselessly and wastefully into the sea. In times of drought I have been asked to pray to God for rain. I have replied that the only supplication I could make would be, 'Oh, God, forgive us for our idleness, folly, and unthankfulness, and give us grace in the future to use better and more wisely Thy gracious gifts.'

Australia is not the dry, arid country it is sometimes caricatured to be by uninformed people. The continent is well supplied with rivers, great and small, which require only to be regulated and turned to account. "Among the anomalies which may be said to distinguish the continent of Australia from other inhabited portions of the globe, not the least remarkable has been the almost unnoticed existence of one of the largest and most navigable rivers in the world." Half a century has gone by since Mr. Arthur Kinloch, chronicler of the trip of the *Lady Augusta*, made that statement, and Australians have been too busy to appreciate what Bishop Moorhouse characterised as a "gracious gift" of Providence. The time has arrived for harnessing the Murray and its tributaries so that they may be made to serve the producer and the trader, and at the present time a Bill is before the Parliaments of New South Wales, Victoria, and South Australia providing for the locking of the river and the building of storage reservoirs.

Navigation and Irrigation.

The Murray, which flows through South Australia for a distance of about 400 miles, not only represents a great highway of trade to the interior, but for a comparatively small outlay the water can be utilised as a fertilising agent for many thousands of acres of what would be among the most productive land in the State under irrigation. South Australians who know their country and appreciate its resources are expansionists. They challenge the future, confident in the knowledge that the State has rich stores of hidden treasure as yet unrevealed. This particularly applies to the valley of the Murray and to lands adjacent to good supplies of water—surface and subterranean. The achievements recorded by colonists in this State are but an indication of greater victories which will be shared by immigrants who, aided by a little capital, are prepared to make their homes in South Australia. It is officially estimated that there are 160,000 acres of low-lying lands along the Murray within this State which at moderate cost can be made available for intense culture. In addition, Lake Albert, near the mouth of the river, is capable of reclamation, and this would provide an additional 40,000 acres. The



S.S. "Gem," with Parliamentary Party on Board, River Murray, near Renmark, January 13th, 1906.

higher lands on each bank of the river within a distance of five miles are for the most part very suitable for cultivation under irrigation, and aggregate an area of over 1,000,000 acres. This land is quickly coming under cultivation for cereals. The country served by this magnificent waterway is a land of alluring contrasts and limitless possibilities. The Rivers Murray, Darling, and Murrumbidgee, which supply a navigable highway for a distance of 3,000 miles, represent, from a trading point of view, "gateways" to the interior. When they are locked they will prove more serviceable than 10,000 miles of railways would be to the settlers, and in addition will supply a permanent stream which can be indefinitely drawn upon for purposes of production.

Striking Contrasts.

Australia is a land of striking contrasts and widely divergent interests. It is unreasonable to expect that methods of industrial conquest conceived in one corner of so vast a continent are applicable to all parts of it. It is necessary to diversify systems as it is imperative that products should be varied and the demands of markets at home and abroad carefully studied. Beyond all argument is the fact that to have a contented community of rural people there must be some guarantee

of certainty of crops. Attempts have been made in various parts of Australia to do that ; and, notwithstanding temporary checks and occasional failures, the results on the whole have shown that, with a ripened experience, irrigation can be made to pay in Australia as well as elsewhere. Marvellous results have been obtained at Mildura and Renmark. In the one case about 5,000 acres of mature vines have yielded in one season produce equal to £40 an acre. The 10,000 acres of cultivated land at Mildura is carrying a population of 5,000 persons. Renmark carries 1,000 people on 3,000 acres, chiefly under orchards and vineyards, and produces an annual crop of fruit worth last season about £80,000. A case is quoted from there of 100 acres of vineyard having been leased at a rental of £11 an acre per annum ; in other words, £1,100 is to be paid for the right to take the crop off 100 acres each season ! Over the fence, where the country is in its natural state, the passer-by would label it "desert," and would not pay a rent of 11d. per square mile ! At Lyrup, near Renmark, success has been achieved by a Village Settlement. From 262 acres last season they secured currants and dried fruits to the value of £5,896. Some of the best results obtained from irrigation are being secured from the growing of fodder for dairy



On the River Murray.—Mouth of Rufus Creek, through which Lake Victoria is Emptied as the River Falls Below the Level of the Lake.

cows, fattening stock, or producing lambs for the export trade. Irrigation is becoming more and more an exact science, and the better it is understood the greater the variety of industries it will be made to influence. There are other Irrigation Settlements and private irrigation works, and a Bill is before Parliament giving increased facilities for settlement.

A Magnificent Asset.

The Surveyor-General, in an annual report, stated that the area of low-lying lands on the banks of the Murray in South Australia was about 170,000 acres, but to that must be added the 40,000 acres represented by Lake Albert, which, from the point of view of redemption, is a simple proposition. The reclaiming of Lake Alexandrina, if practicable, is a scheme which will probably be left to future generations, because of its colossal proportions. The Surveyor-General wrote—"An effort is being made to successfully utilise some of our most valuable but hitherto little-used swamp lands, a very large area of which is situate on either side of the River Murray for nearly its whole length, and capable, with moderate expenditure, of keeping many thousands

of people. The area of low-lying lands along the river valley between Wellington and the State boundary is, excluding freehold property, approximately 170,000 acres, and with an average outlay of about £6 an acre that land would be worth at the lowest calculation £20 an acre, or £3,400,000. About 10 acres would keep a family, say, of four persons; and the whole area should support a population of 68,000. As the bulk of this land is Crown lands, and the balance held on lease that could be easily acquired, it is one of our most valuable assets. An area of 656 acres has been reclaimed on the east side and north of the Murray Bridge, and is now awaiting settlement, and about 1,100 acres at Monteith's Flat—situated about seven and a half miles south of the Bridge—are in course of reclamation."

In addition to the 211,000 acres thus accounted for, adding the Lake Albert scheme to the Surveyor-General's estimate, there are a number of swamps and a larger area of low-lying lands held privately which are capable of similar treatment. What is true of the Murray within the State of South Australia is more or less applicable to river valleys in the up-stream States. In the problem of the conquest of aridity it is important, therefore, that attention should be devoted to the work of reclamation.

Expansion and Efficiency.

In this work of conquering unutilised lands men of vision and imagination are needed—men who will welcome difficulties as something to overcome; men who, having faith in Australia and in themselves, will take pleasure in extolling their country and their fellow-citizens of the Commonwealth. In the bridging of the continent by railways the conserving of water when the floods come, so that the great lifegiver and fertiliser may be available as required, there are questions involved which are worthy the attention of statesmen. In the expansion of the wool and wheat-growing industries, in the raising of more cattle and horses, in the extension of dairying, and in the hundred-and-one so-called "minor" industries of the farm, there is scope for the intelligence of young Australians who have grit and grip. As a people, Australians are beginning to realise what a great country they possess. Their goal is national expansion with national efficiency, and the holding of their great island continent for a white race.



Junction of the Darling River with the River Murray, near Wentworth.



CHAPTER XXVI.

WATERWORKS AND ARTESIAN WELLS.

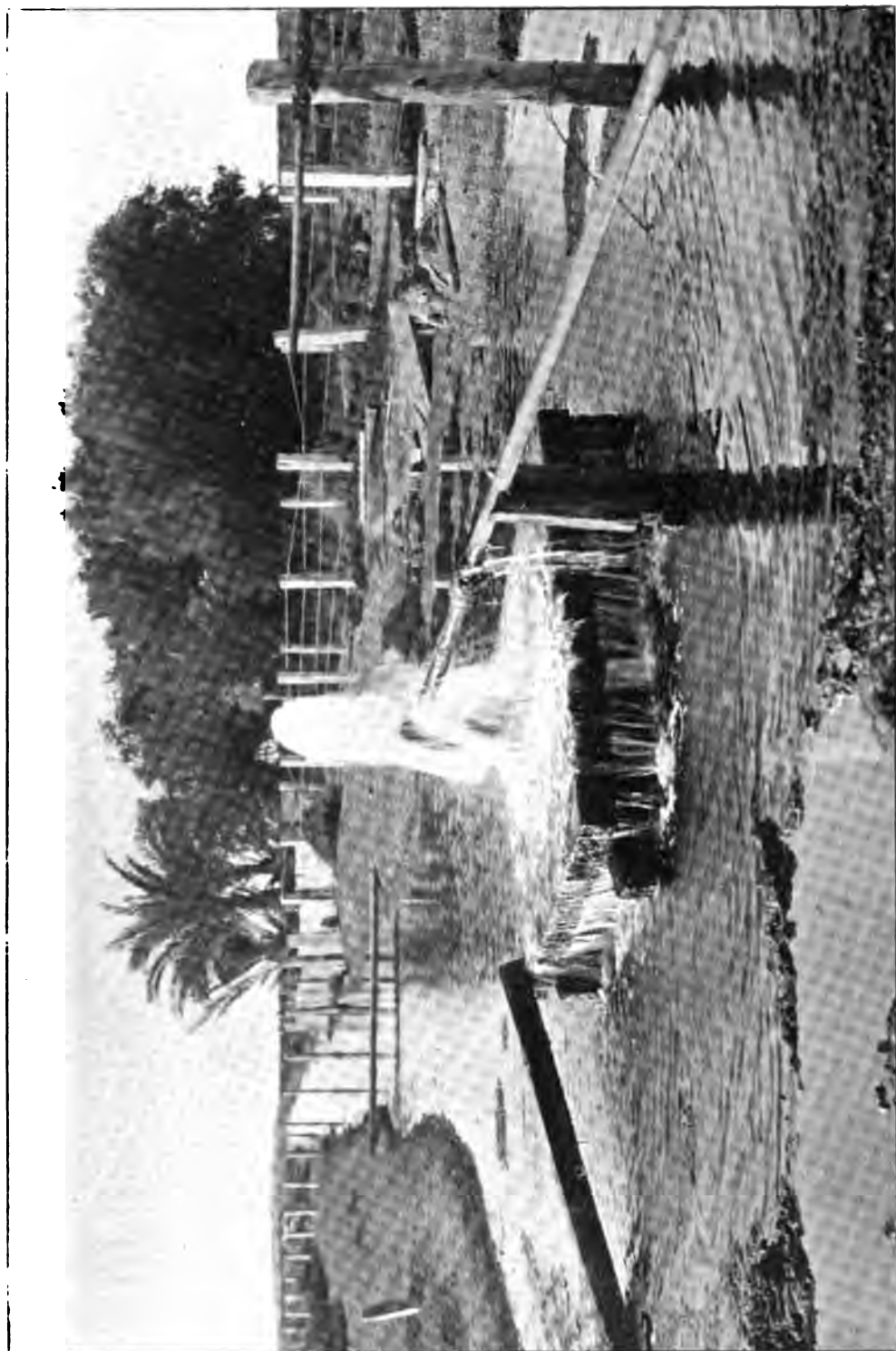
THOUGH in the 72 years since its first colonisation the population of South Australia has only ranged from about 400 people in 1836 to not quite 400,000 at present, this small community had, up to last June, expended more than four and three-quarter millions of money in water conservation and reticulation—to be exact, £4,754,916. Roughly, the £4,000,000 was spent in reservoirs and reticulation for the settled areas, and the odd £750,000 in water provision for outside and remote districts and the opening up of mail and cattle tracks into the central and north-eastern borders of the State.



Weir at Clarendon, in connection with Happy Valley Reservoir, from which the City of Adelaide Draws Portion of its Water Supply.

Reservoirs and Reticulation.

Between Happy Valley, a few miles south of Adelaide, and Port Augusta, in the north, there is a stretch of country 200 miles long—and 80 miles wide in one part, between Moonta and Freeling—reticulated with a constant and ample supply of water from the various reservoirs of the Metropolitan, Barossa, Bundaleer, Beetaloo, Port Germein, and Port Augusta systems. In all that distance there are only three spaces between the main pipe ends, viz., 12 miles between Port Augusta and Beetaloo mains, four miles between the Bundaleer and Barossa, and 14 miles between the Barossa and Metropolitan terminals. In connection with these systems the area of land gazetted for water rating totals 3,910 square miles, and this is served by more than 2,000 miles of mains.



AN ARTESIAN BORE.

Over 110,000 Square Miles of the Great Artesian Basin Lies in South Australia.

(CH. XXVI.)

[Chas. P. Scott, Photo.]



The Barossa Reservoir.

[Govt. Photo.]



Bundaleer Weir.

[Govt. Photo.]

The respective details are as follow :—

THE PRINCIPAL SYSTEM.

Reservoirs.	Capacity in Gallons.	Acreage Served.	Miles of Main.
Metropolitan group	3,898,924,000	76,532	667
Barossa	993,626,000	610,842	293
Beetaloo	856,179,000	1,074,674	783
Bundaleer	1,333,177,000	618,509	147
Port Augusta (including Nectar Brook and Mundallio)	186,005,000	106,655	116
Port Germein	1,500,000	11,347	12
	7,264,411,000	2,498,559	2,018



Artesian Water under Control by Valves, Mungeranie Bore.

In addition to these there are other country districts served, reticulating 311 square miles. The total extent of country for which reservoir water was available last year was 4,211 square miles, the reservoirs holding in the aggregate 7,370,000,000galls., and the main pipe-lines reaching 2,177 miles. The capital cost of the works under the waterworks branch, as distinct from the water conservation branch, which deals with isolated and remote districts, was £4,016,000, and the net revenue in 1906-7 £121,250, returning a net percentage of 2.133 on the cost of the works. The above figures show that provision has been made for a supply that would give more than 18,000galls. of water annually for every man, woman, and child in the State.

Wells, Tanks, and Dams. At intervals on all the main routes to the furthest borders of the State wells have been sunk and provided with troughs, buckets, and whips for the use of travellers in obtaining water for drinking and for watering stock; or catchment dams and tanks serve the same purpose where underground supplies are not to be got by sinking. The various storages and apparatus are

regularly inspected and maintained in the best order practicable. These various supplies and the construction of artesian tube wells are provided out of water conservation loans, and to last June £739,269 had been thus expended.

Artesian Wells. The State of South Australia and its "dependency," the Northern Territory, are blessed with a large share of the Great Artesian Basin of Australia. The intake bed of this is the western slope of the coast range from Cape York, the northernmost point in Queensland, into the north-eastern corner of New South Wales. Over this range the rainfall is exceedingly heavy, averaging 51in. at Brisbane, 70in. at Cooktown, 72in. at Mackay, and 149in. at Geraldton. These figures will give an idea of the fall in the territory referred to. On the western slope there is a large sandstone formation so porous that the rain water as it runs off the hilltops is mostly absorbed by the sandstone rocks,



Kopperamanna Artesian Bore.

and the volume along the surface is considerably decreased by this loss. Were it not for this enormous absorption by the porous band no doubt the Diamantina River, Cooper's Creek, and other streams which flow southward from Queensland into South Australia would, instead of running intermittently, be strong rivers. Thus yearly a very large supply of water flows through the intake beds and passes underground to replenish the water-bearing area of the Artesian Basin. This annual contribution is so large that, according to an eminent authority, the comparatively small quantity discharged by the bores, however numerous they may be, will probably make no permanent difference to the subterranean storage. The extent of the Australian Artesian Basin is 590,000 square miles, of which South Australia has about 120,000.

South Australia was one of the first States to move in extensive artesian boring. Every successive experiment was keenly watched, and before long a definite area was mapped out, covering parts of Queensland, New South Wales, and South Australia, in which it was tolerably

certain that water in great quantity could be obtained almost anywhere by the use of the boring rods. The theory formed—that the excessive rainfall on the Queensland Great Dividing Range soaked down into an immense layer of porous strata between two impervious rock beds, forming a sort of water sandwich—has proved so good a datum that hydrostatic and other calculations based upon it give close approximation to the depths required for boring wherever the contours of the country in that region have been mapped out. South Australia has 130 Government wells described as “bores,” and an unascertained, but rapidly increasing, number put down by private enterprise.



Life in Central Australia.—Manager of an Artesian Boring Party and his Wife.

Opening Up of Stock Routes.

South Australia has conferred an enormous boon on the whole of the Commonwealth by providing immense subterranean supplies along four great routes used for driving stock from the border districts of Queensland, the Northern Territory, and New South Wales to the markets of the various capitals. Some of these tracks were at one time absolutely impassable for months together, owing to the dearth of water, where now immense herds can travel over them in the driest seasons, and in one or two instances the stream from a single bore is said to flow along the line of route for as far as 30 miles. The accompanying table shows the enormous volumes of liquid liberated and the great thickness of rock that had to be bored through to get at the porous beds. The hottest water in Australian artesian flows is found in South Australia—that at Goyder's Lagoon coming up at a temperature of 208° Fahr.; and the flow at Mount Gason being at 204°.

There are also a number of flowing wells outside the Great Artesian Basin, including the Tintinarra bore, on the Adelaide to Melbourne Railway (253ft. deep, giving 4,300galls. daily); Boolcunda (687ft. deep, giving 19,200galls.); and others in various parts of the State.

PRINCIPAL SOUTH AUSTRALIAN ARTESIAN WELLS.

	Depth in Feet.	Gallons Daily.	Temp. Fahr.
			°
Goyder's Lagoon	4,580	600,000	208
Mount Gason	4,420	480,000	204
*Patchawarra	3,995	—	—
Mirra Mitta	3,529	470,000	190
Mulka	3,433	539,000	—
Mungeranie	3,370	600,000	187
Kopperamanna	3,000	800,000	176
Dulkaninna	2,226	1,000,000	148
Coonanna	2,030	500,000	134
†Cooie Appa (Coward to Tarcoola)	1,858	—	—
Lake Crossing	1,703	200,000	115
Yadama Creek	1,642	432,000	132
†Mirrabuckina	1,635	—	—
Oodnadatta	1,571	270,000	112
Storm Creek	1,550	86,400	115
Muloowurtina	1,432	314,000	128
Hamilton Creek	1,417	232,000	115
Lake Harry	1,360	100,000	116
Anacoora	1,250	700,000	135
Petermorra (stock water)	1,243	192,000	—
Stevenson Creek	1,192	180,000	—
Port Pirie	852	50,000	78
Hergott	342	100,000	—
Coward Springs	308	1,250,000	—
William Creek	229	20,000	—

* Small supply.

† Very large supply.

‡ Large supply; brackish.

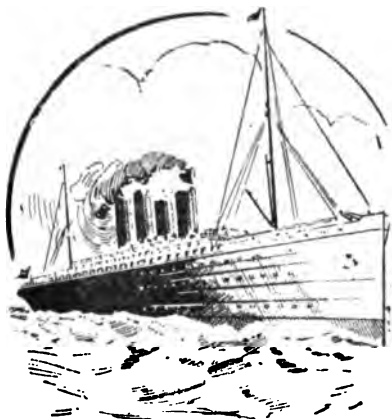


Weir Across Torrens, near Adelaide.

[Govt. Photo.]

CHAPTER XXVII.

THE SHIPPING TRADE.

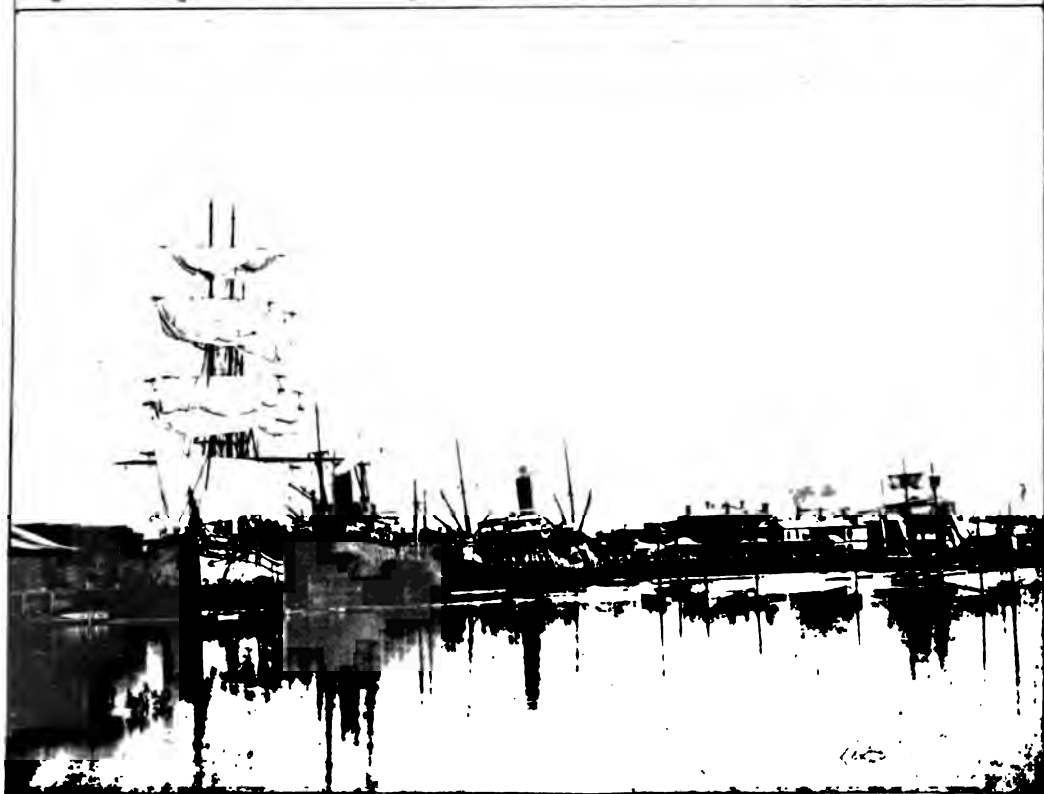


THE shipping trade has always occupied and must retain an important position in the development of South Australia. It cannot be otherwise with a producing country of extended coastline situated thousands of miles from the chief markets of the world. Notwithstanding a splendid inter-State railway system, the bulk of the produce exchanged with other parts of the island continent is transported by water. South Australia has 2,000 miles of coastline within her own borders, thus making necessary the employment of a large fleet of coasting vessels. The development in the maritime branch of industry within the short period of the State's existence has been no less marvellous than in other directions, and the achievements are as worthy of being recorded, even though they form part of a

world-wide movement. Especially is this true of the bringing into existence of a distinctly Australian mercantile marine, in which South Australian enterprise and capital have played an important part. The history of South Australian shipping is the record of the rise and development of long-distance steam communication by water. It was a year after South Australia was proclaimed that Brunel demonstrated that a regular steam service could be maintained between the United Kingdom and the United States of America. Experts at that time considered that steamers would never be able to make the voyage to India, much less to Australia. The first steamer entered Sydney harbor in 1831. Attempts were made soon afterwards to establish regular steam communication with the newly-founded British dominions beyond the seas, but as the Cape route had to be followed the cost of coal proved prohibitive. For many years South Australia had to depend for intercourse with the old world upon a type of sailing vessel long since obsolete, manned by as intrepid navigators as ever sailed the ocean. Later on came the clipper barque, which made such remarkable passages. Then followed the ocean leviathan, cutting off corners, and making the voyage as safe and regular in point of time—and indeed more so—as the Channel service between England and France was half a century ago.

Pioneer Trading Vessels.

What may be regarded as the first trading vessel to touch these shores was the *Duke of York*, the pioneer ship chartered by the South Australian Company. This barque, of 197 tons, in command of Captain R. G. Morgan, anchored in Nepean Bay, Kangaroo Island, on July 27th, 1836. She brought 36 immigrants, and was followed on August 2nd by the *Rapid*, with Colonel Light on board, by the *Lady Mary Pelham* and the *John Pelham* about the same time, and by the *Buffalo*, with Governor Hindmarsh, in December of the same year. At that time over 100 days was required to complete the voyage from England to South Australia. Mails are now delivered within the month, and this time could be considerably reduced by the completion of the railway from Adelaide to Port Darwin. The State in its early years of existence was dependent much more than it is to-day upon the maintenance of communication with the outside world. Thus the foundation was laid of an oversea and inter-State trade which annually reaches many millions sterling. The commerce of South Australia was first carried on by means of wooden sailing vessels. The early arrivals included such names as the

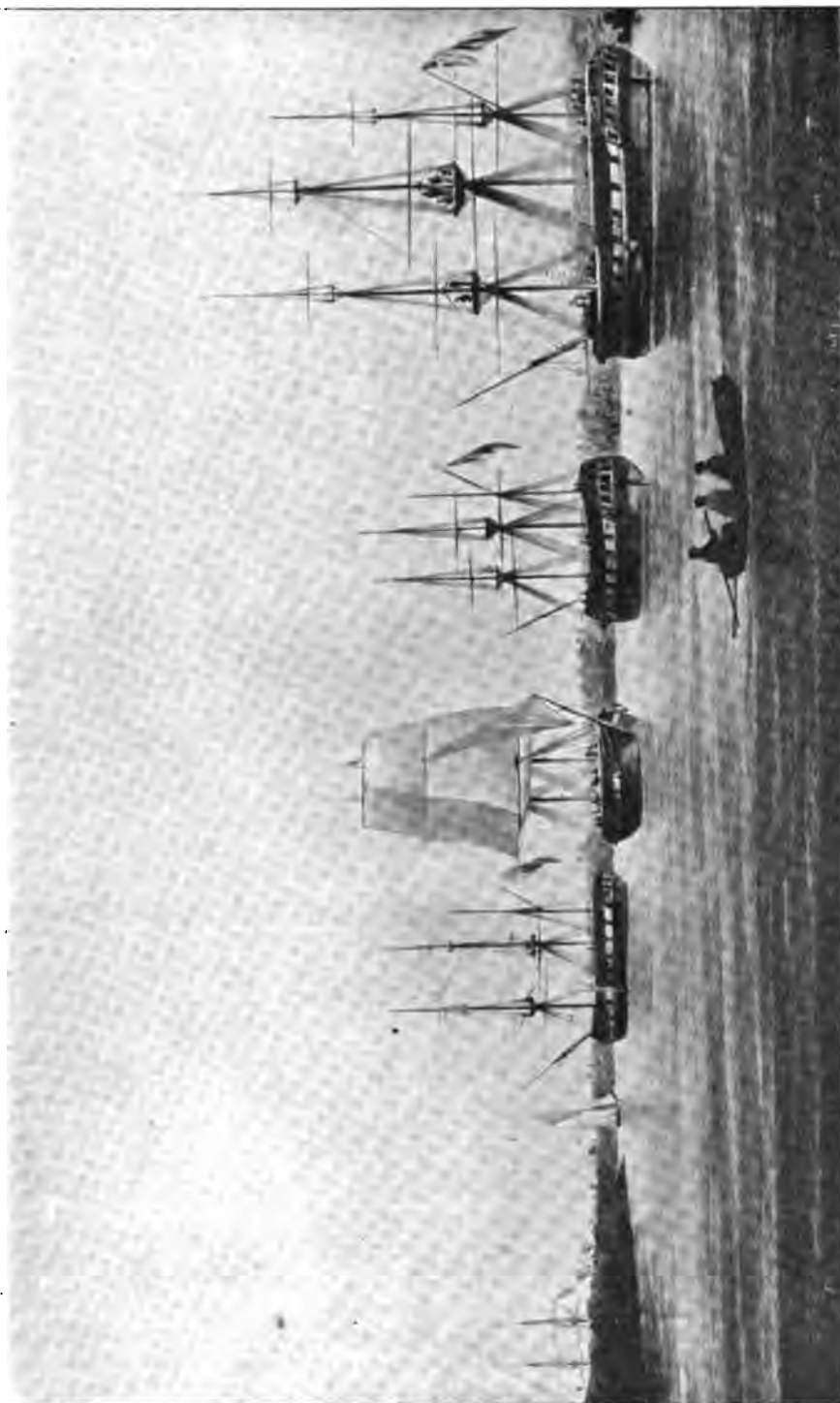


TWO VIEWS OF PORT PIRIE HARBOR.

[C. Mallyon, Photo.]

Port Pirie is the Largest Outport in South Australia and the Fourth Largest Port in the Commonwealth.

(CH. XXVII.)



DAVID, 204 Tons

HENRY PORCHER, 610 Tons.

GOSHAWK, 245 Tons.

EDEN, 627 Tons.

EMERALD ISLE, 601 Tons.

VIEW OF PORT ADELAIDE IN THE EARLY DAYS OF THE STATE.

Africaine, Orleans, Platina, Hoogly, Lalla Rookh, and Competitor. In those days a vessel of 500 tons was considered a large craft. These ships with bluff bows have passed out of recollection. About the sixties composite vessels having iron frames and wooden planking began to become popular. Among the best known of these were the *Glen Osmond, Beliana, Collingrove, and Torrens*. In the wake of the composite vessels came those constructed of iron, and native names were perpetuated in the *Barossa, Barunga, and Kadina*. Clipper built barques sprang into prominence about this date, and surprisingly smart were some of the passages logged by wool-laden "wind-jammers" timed to catch the London sales.

Built for freight and yet for speed, .
A beautiful and gallant craft.

The last stage in the evolution of sailing vessels was the substitution of steel as the material of construction.

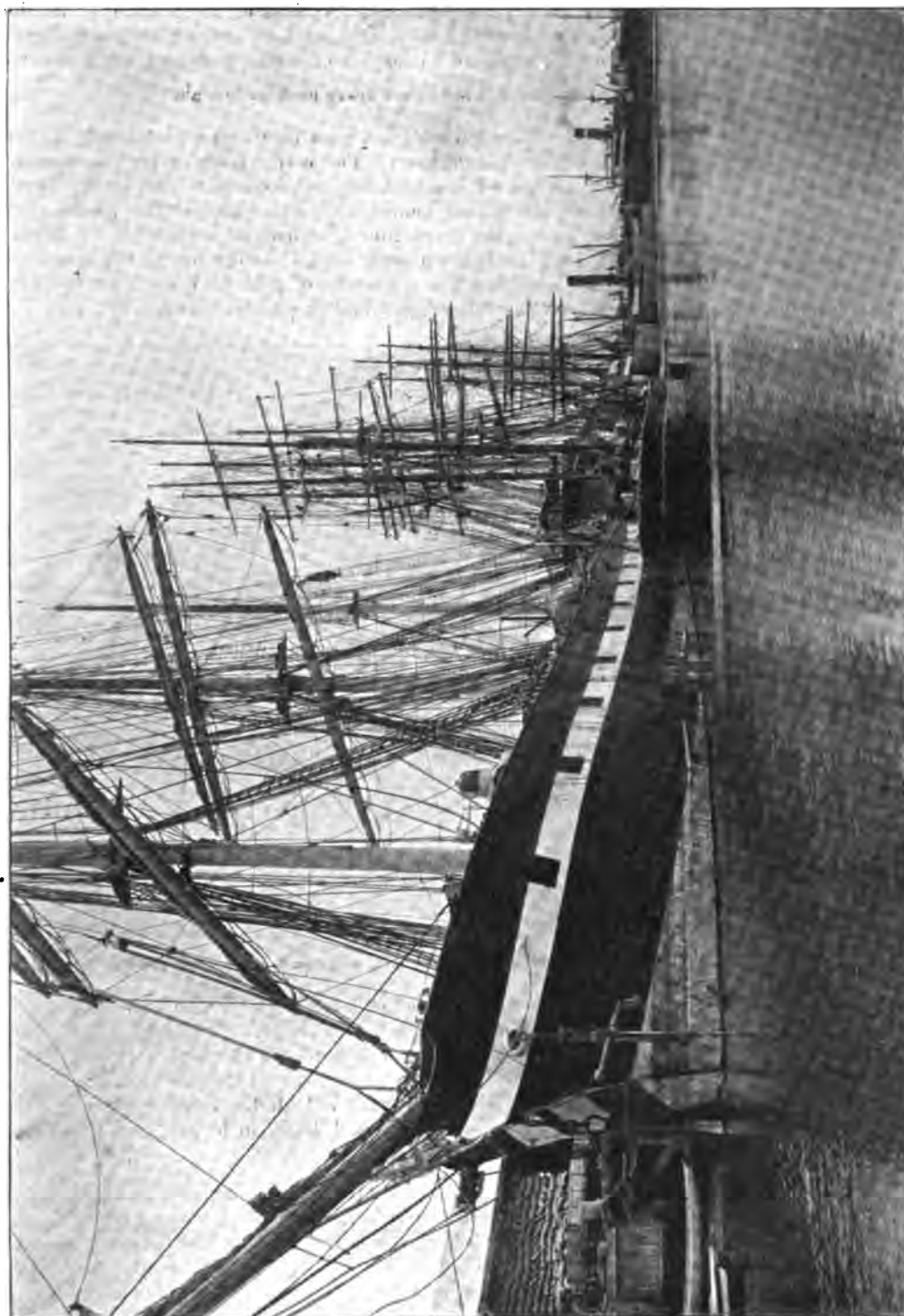
Transition from Sail to Steam. Half a century of progress is shown in the following table of entries and clearances at South Australian ports :—

						Inwards.		Outwards.	
						Number.	Tons.	Number.	Tons.
1850	..	..	..	..	..	284	86,583	275	87,872
1860	..	..	..	..	..	324	100,681	338	108,355
1870	..	..	..	..	..	445	140,081	471	1 7,908
1880	..	..	..	..	..	1,045	590,085	1,111	610,819
1890	..	..	..	..	..	1,041	1,075,133	1,081	1,115,309
1900	..	..	..	..	..	1,010	1,780,383	1,003	1,772,253
1907	..	..	..	..	..	1,300	2,925,792	1,306	2,937,319

The most significant change in the shipping industry was the superseding of sail power by steam. The bulk of South Australia's overseas traffic is now conducted by large steamers ranging up to 10,000 tons, and these almost invariably bring cargo for more than one State; consequently their stay in port is only a fraction of the time which used to be spent by the old style traders which ran direct between Port Adelaide and the United Kingdom. The evolution from sail to steam and the growth of tonnage is illustrated by the following table of arrivals in South Australia :—

						Sail.	Steam.	Total.
						Tons.	Tons.	Tons.
1848	..	..	..	..	..	} All sail		46,640
1858	..	..	..	..	..			98,802
1868	..	..	..	..	..			136,051
1878	..	..	..	..	..			452,738
1888	..	..	..	..	..			973,479
1898	..	..	..	..	..	225,098	748,381	1,722,358
1902	..	..	..	..	..	156,753	1,565,605	1,944,612
1907	..	..	..	..	..	155,014	1,789,598	2,925,792
						204,408	2,721,384	

The first steam communication between England and South Australia was opened in 1852 *via* the Cape of Good Hope. The service did not last long. The same year, however, a branch line was established by the P. and O. Company between Singapore and Australia. In 1857 the need of an improved connection with the outside world was felt. The Chamber of Commerce, in a petition to Parliament, expressed the opinion that direct steam communication with Great Britain combined with emigration and a postal service would prove highly advantageous. The opening of the Suez Canal now effected a complete revolution in ocean traffic between Europe and Australia. Branch lines became trunk services, and South Australia occupied a more



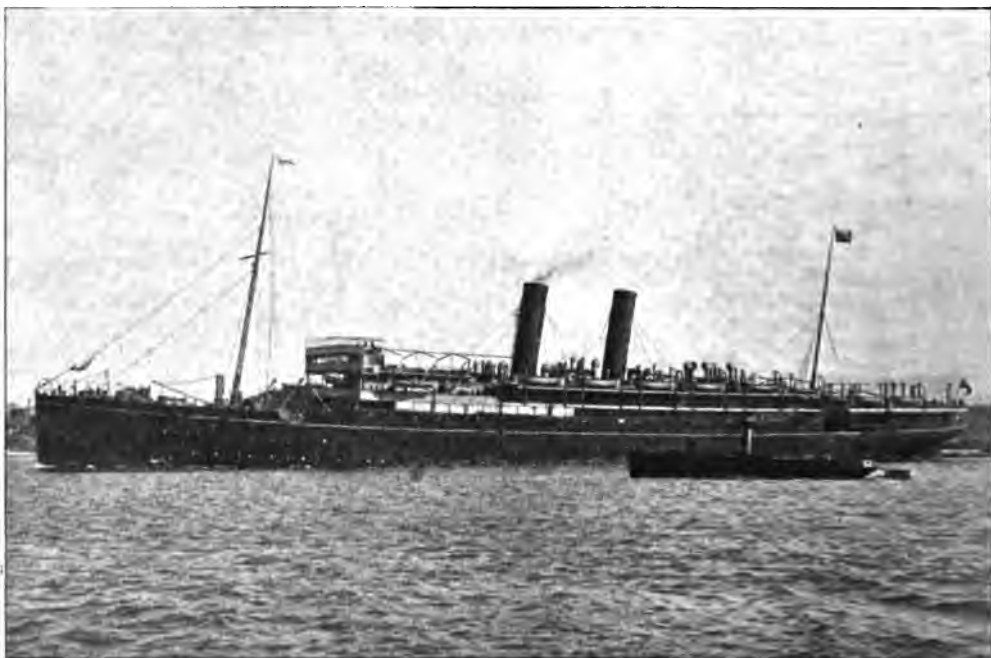
VIEW OF PORT PIRIE HARBOR.

prominent part in the time table of ocean steamers. To-day the steamers of four large mail companies include Port Adelaide in their timetables, and the flags of three nationalities float over the splendid specimens of marine architecture which regularly convey large numbers of passengers to and from these shores. Increased harbor accommodation is now being provided for these

Swift shuttles of an Empire's loom that weave us main to main

The Inter-State Service.

The inter-State shipping business furnishes a picturesque chapter in South Australian history. For many years water carriage was the only means of maintaining relations with the other settled portions of the island continent. The bulk of the goods traffic between the States is still carried on by sea, the proportion being over 60 per cent. of the carrying trade of each portion of the mainland. In 1847 no fewer than 115 ships out of 150 arriving in South Australia came from British colonies. The discovery of gold in Victoria in the fifties led to a rush for berths on every available craft which could be pressed into service.



P. & O. R.M.S. "Macedonia," Trading to Australia, 10,512 tons, 18,000 horse-power.

In 1859 clearances for the adjoining State of Victoria numbered 199 ships, of 30,967 tons, out of a total of 319 vessels, of 73,789 tons, including river traffic. Gradually trade became established, a tourist movement was encouraged by the purchase of modern steamers, and, notwithstanding the construction of railways, the coastal service has steadily expanded. Fast and well-appointed steamers trade between South Australia and all the chief Australian ports. The inter-State service includes steamers of 7,000 tons and 400ft. in length, and these come into the inner harbor.

Inner Harbor Accommodation.

South Australia has participated in the benefits arising from the increase in the size of ships during the past 50 years. Of 102 vessels which arrived in 1859 the largest was 600 tons, and for many years the greater number fell beneath 1,000 tons. Of 315 arrivals in 1868, only one exceeded 1,100 tons, while in 1878 the limit was 2,700 tons. Ten years later no fewer than 40 vessels which reported in South Australia were from 3,000 to 3,500 tons register. Now

the majority of merchantmen calling here are of mammoth proportions. As illustrating this, the following list of the largest steamers to enter Port Adelaide harbor during 1907 stands out prominently :—

Name.								Tons, Gross.		Tons, Net.
Delphic	..	..	..	..	..	..	..	8,273	..	5,401
Cufic	..	..	..	..	..	..	..	8,250	..	5,444
Tropic	..	..	..	..	..	..	..	8,230	..	5,411
Everton Grange	..	..	..	..	..	..	..	8,096	..	5,212
Geelong	..	..	..	..	..	..	..	7,954	..	5,134
Ayrshire	..	..	..	..	..	..	..	7,713	..	4,928
Palma	..	..	..	..	..	..	..	7,632	..	4,913
Dorset	..	..	..	..	..	..	..	7,630	..	4,905
Suffolk	..	..	..	..	..	..	..	7,573	..	4,854
Essex	..	..	..	..	..	..	..	7,530	..	4,831
Tydeus	..	..	..	..	..	..	..	7,441	..	4,800
Oswestry Grange	..	..	..	..	..	..	..	7,368	..	4,742
Somerset	..	..	..	..	..	..	..	7,150	..	4,576
Ajax	..	..	..	..	..	..	..	7,040	..	4,478

Increased tonnage and greater draft of water have necessitated a vigorous policy of harbor improvement. In the early days the mariner had to guard against the danger of having his ship left high and dry on the mudbanks when the tide receded. At the present time steamers of from 5,000 to 8,000 tons comfortably berth at the wharves. Captain John Jones was the first mariner to enter the Port Adelaide inlet. In 1836 Colonel Light, in an official report, referred to what was destined to become the chief port of South Australia in the following terms :—"I have no hesitation in saying that with the entrance buoyed ships drawing 16ft. of water may go in with ease, and when in there is no safer or more commodious harbor in the world for merchant ships." On May 25th, 1839, Governor Gawler turned the first spadeful of earth in connection with the construction of a road leading from the river to the high ground at the rear of the swamps. This marked the establishment of the city of Port Adelaide at its present site, the "old Port" having been laid out higher up the river. McLaren Wharf was formally declared open to the commerce of the world on October 14th, 1840. Improvements since then have been continuous, it being the boast of the authorities that any vessel which can pass through the Suez Canal may with perfect safety proceed to the wharves. During 1907 the longest vessel to enter the harbor was 476ft. in length, and the most deeply laden steamer on departure drew 28ft. 2in. As, however, there was depth of water of 31ft. 6in. at high water on the day of departure of the most deeply laden vessel, shipowners have no occasion to fear that the river cannot be expeditiously and safely navigated at almost any time. The construction of a first-class harbor at the chief ports of the State has been effected by the outlay of a large sum of money. Total expenditure upon deepening and improving the ports of South Australia to June 30th, 1902, exceeds £1,000,000, of which Port Adelaide has absorbed, June 30th, 1907, £776,000, and Port Pirie, June 30th, 1907, £150,000. The channel leading from the anchorage, where the English mails are loaded and discharged, to the wharves at Port Adelaide, a distance of about nine miles, is deepened to 23ft. low water springs, but ordinary high water springs give from 31ft. to 32ft. of water. The width of the channel is nowhere less than 250ft., and in some places it is as much as 500ft. The work of deepening and widening certain portions so as to straighten out curves and make the channel still more easily navigable by steamers of great length is still in process. No harbor tolls have been charged to ships to meet this heavy outlay.

Port Adelaide has two and a half miles of wharves, mostly privately owned, representing an outlay roughly of £1,000,000 sterling. Further wharf construction is at present in hand on the Birkenhead side of the river, to give a depth of 28ft. at low water spring tides. A swinging berth 600ft. long, deepened to 23ft. at low water, meets the convenience of large vessels unable to turn in the harbor, and a mooring berth 700ft. long, with a depth of 26ft. at low water, is available for special occasions, and has been utilised by visiting war boats. Four patent slips privately owned are capable of taking on vessels of from 300 to 1,500 tons.

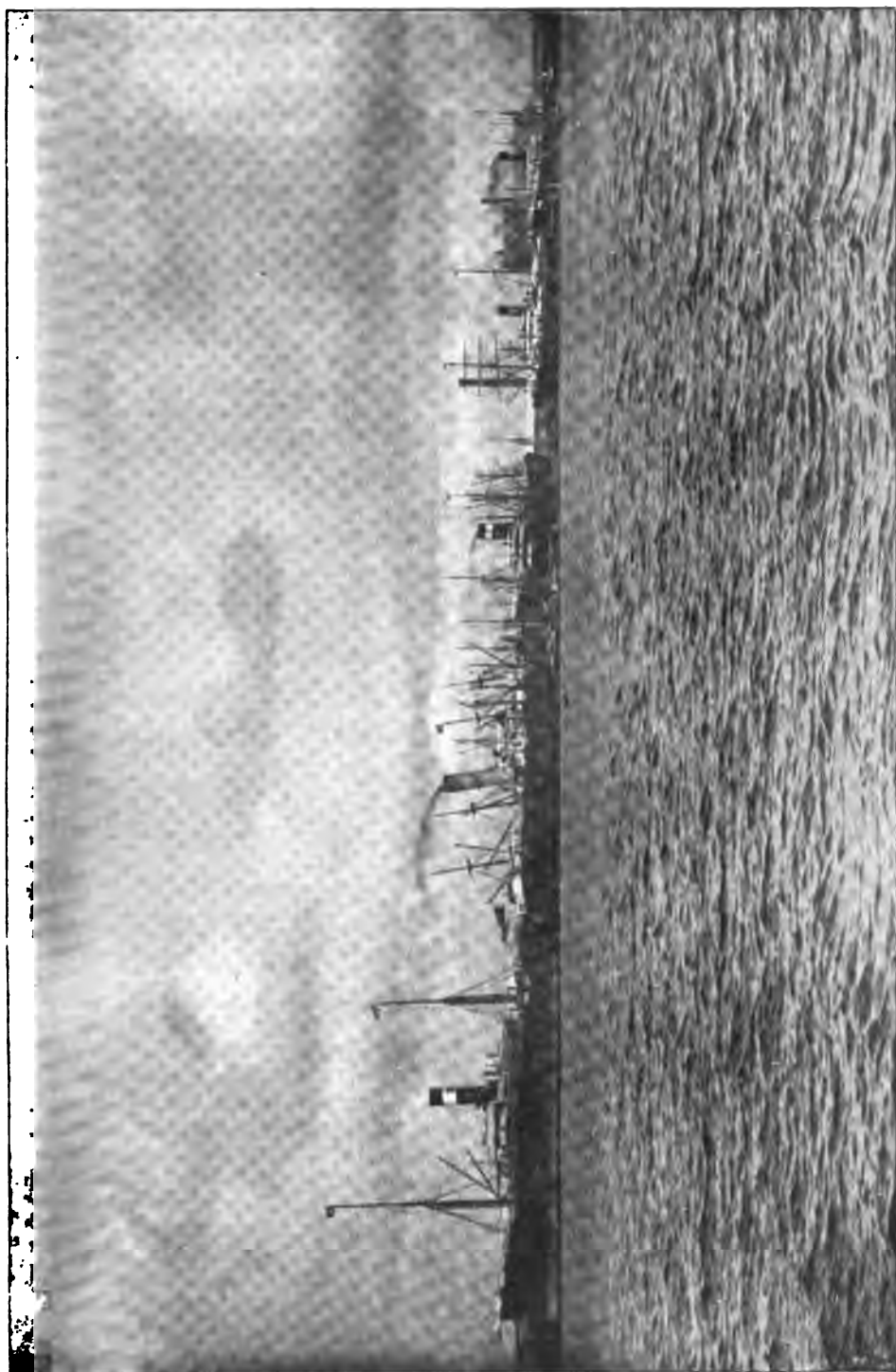
An Outer Harbor.

A description has been given on a previous page of the wharfage accommodation at the inner harbor at Port Adelaide, and when quick dispatch such as that required by mail steamers is not of prime importance the facilities provided there leave little to be desired. But in the case of large ocean steamers calling at the Semaphore anchorage only, to which time is of great consequence, it has long been felt that the primitive method of landing passengers by transfer to launches, in all sorts of weather and occasionally under conditions of great danger, is greatly behind modern requirements and not creditable to the harbor or the State. After several schemes had been introduced for the solution of the difficulty, none of which gave complete satisfaction, a plan was submitted by the Engineer-in-Chief (Mr. Moncrieff) for the construction of an outer harbor at Light's Passage, and in 1903 a Bill was passed through Parliament authorising the construction of the same. The work was put in hand at once, but difficulties were experienced in carrying out details, and it was not until January 16th,



Mail Steamer "Asturias" at the Wharf, Outer Harbor.

1908, that the harbor was declared open to the shipping of the world. The works are still in an incomplete state (1908), but there is even now ample accommodation for the largest steamer visiting Australia to berth in perfect safety alongside the wharf. The wharf when complete will have a frontage of 1,500ft. The entrance channel will be 400ft. wide, and there will be a swinging berth 3,000ft. in length by 1,126ft. wide. The depth of water in the entrance channel, swinging berth, and alongside wharf will be 33ft. L.W.S. throughout. The railway has been extended from Largs Bay, and a commodious railway station is in course of construction in close proximity to the wharf. Post and telegraph office, refreshment-rooms, Customs sheds, and all necessary facilities for handling and disposal of cargo are provided. An up-to-date acetylene gas plant has been installed for the efficient lighting of wharf and railway. The Railway Department have provided a convenient service of trains for the benefit of passengers *en route* by the mail steamers who may desire to visit Adelaide or go overland to the Eastern States. In view of the increased demand by ocean steamers using the harbor, the wharfs are to be extended at an early date.



Ocean Steamers alongside a Wharf in the Harbor at Port Adelaide, the Chief Port of South Australia.



Principal Outports. There are over 40 proclaimed ports around the coastline of South Australia. Port Pirie, situated in Spencer's Gulf, ranks next in importance to Port Adelaide. The channel has been deepened and widened, and the harbor is able to accommodate the largest vessels. Port Pirie is known as the Liverpool of South Australia. The greater portion of the Broken Hill traffic passes through Port Pirie. The silver-smelting works at Port Pirie are said to be the largest of their kind in the world. At Port Germein, situated 10 miles from Port Pirie, is a jetty 5,459ft. long, frequented by many large vessels which load wheat drawn from the upper north and middle divisions of the State. Victor Harbor is the outlet for the River Murray trade, and a splendid breakwater there gives protection to the largest steamers in all weathers.

Port Augusta, at the head of Spencer's Gulf, has lost much of its former importance owing to the decline of the pastoral industry in the Far North of South Australia. The fine harbor causes Port Augusta to be specially favorably situated with regard to the great interior country stretching to the Queensland and New South Wales borders. Wallaroo, further south than Port Pirie, assumes importance as a wheat and copper shipping port, and is a regular calling place with many inter-State steamers. There are large copper-smelting works at Wallaroo. Kingston, on the south-eastern coastline, forms the outlet for most of the wool grown in that part which finds its way direct to London. At present an effort is being put forward to secure a harbor for the South-East capable of accommodating deep-sea steamers. Edithburgh, on the south-eastern point of Yorke's Peninsula, has come into prominence of recent years owing to the development of a salt industry in the neighborhood. The following table shows the inward and outward tonnage at the chief ports of South Australia during 1907 :—

	Total Trade.	Inwards.		Outwards.	
		Vessels.	Tons.	Vessels	Tons.
	£				
Port Adelaide	12,553,146	851	2,288,334	780	2,208,045
Port Pirie	1,886,570	118	254,342	197	386,732
Wallaroo	636,814	76	126,282	50	88,728
Port Augusta	185,391	21	39,722	10	17,459
Edithburgh	6,412	1	674	35	34,672
Port Germein	120,843	6	10,314	7	11,992
Kingston	167,526	10	25,923	8	7,730

The coastline of South Australia is remarkably well lighted, especially considering the comparatively short time that the State has been established. The earliest guiding beacon set up was exhibited from the masthead of an old vessel moored outside the entrance to the Port Adelaide River. This light was first shown on July 17th, 1840, and it was 12 years later before a permanent mark was erected. Lighthouse construction dates from 1852, when a revolving light on Cape Willoughby, situated on the eastern extremity of Kangaroo Island, was set up. Thenceforward, as trade increased and, unfortunately, in some instances as disastrous wrecks demonstrated the necessity, fine lighthouses were constructed around the shores of the State. To-day from 14 towers warm rays of light warn of hidden dangers and guide the way into the desired haven. A lighthouse is in course of erection at Cape De Couedie, on the south-western point of Kangaroo Island. This number is exclusive of smaller local lights, a lightship on Middle Bank, Spencer's Gulf, and the lighthouse at Point Charles, Northern Territory. The total salaries of lightkeepers in 1907 was £6,473, and the aggregate expenditure on lighthouses to June 30th, 1906, amounted to over £160,000. A new light, to give additional safety in the navigation of Backstairs Passage, is about to be erected on Cape St. Albans.

Light Dues and Pilotage.

The cost of lighting the coast is borne by light dues imposed on visiting shipping, the sum raised by this means during 1907 being £25,782. In 1845 the Government of the day considered the state of the finances justified the abolition of port charges on ships of all nations without exception. This condition of affairs did not last long, however, and to-day, in addition to light dues, visiting shipmasters, unless they have been successful in obtaining an exemption certificate, have to submit to compulsory pilotage. The minimum rate of pilotage at Port Adelaide is £2 10s., and the maximum £12, and a sliding scale is provided on the basis of 1½d. per ton. At Port Adelaide the sea pilots are Government servants, the fees being credited to revenue. Wharfage rates on goods landed and shipped over the various wharves are levied by the various owners. With the exception of an enumerated list of goods, the wharfage rate is uniform at 1s. 8d. per ton weight, or 2s. per ton measurement, or, if oversea, 2s. 6d. The necessity of making South Australian ports as cheap as possible has been repeatedly urged upon the authorities, and as a step in this direction a concession was made not long ago whereby the payment



Mail Steamer Entering the Outer Harbor.

of light dues was made to cover a definite period. Tonnage dues are levied by wharf-owners upon vessels loading or discharging at the wharves. Facilities for expeditiously handling cargo have greatly increased with the growth of trade. In the fifties the landing of 130 tons of goods at McLaren Wharf, Port Adelaide, in 10 hours was considered a smart piece of work. Nowadays South Australian stevedores, who have won a reputation for dispatch, can handle as much as 800 tons of goods in the same time.

A Graving Dock.

A company was formed for the purpose of constructing a graving dock at Port Adelaide, and a Bill was passed through Parliament granting the necessary powers; as, however, the conditions were not carried out, the concession has lapsed. It is the intention of the Government to construct an up-to-date commodious graving dock, the dimensions of which will be, approximately—length, 800ft.; width, 80ft.; and depth over sill at low water, 28ft. Such a dock will provide ample accommodation for the largest ships afloat.

Among the early Acts passed in the colony in the first year of the reign of the late Queen Victoria was one entitled "An Act for the better preservation of the ports, harbors, havens, roadsteads, channels, navigable creeks and rivers in Her Majesty's Province of South Australia, and for the better regulation of shipping and entering crews in the same." Originally the marine administration was practically in the hands of Captain Lipson, who was appointed in England as naval officer and harbormaster, and who arrived in the *Cygnets* in September, 1836. It was subsequently found necessary to subdivide his duties between four departments—Customs, Trinity Board, Local Marine Board, and Harbor Trust. The Trinity Board was constituted in 1851, and Captain Lipson was selected as first master of the body. He held office for only three years. The functions of the board were chiefly to license pilots, fix rates, superintend lighthouses, regulate wharves, and supply ballast to ships. Later on the board was charged with deepening operations. Deepening in the Port Adelaide River was started in 1849, but not



Kangaroo Beach, near Spring Cove, Kangaroo Island.—Government Steamer, "Governor Musgrave," Landing Stores.

vigorously prosecuted till 1854. The Trinity Board, finding itself hampered for want of funds, secured a grant of £100,000, and to administer this the four senior members were appointed to give effect to the Act. Thus the Harbor Trust was brought into existence. A few years later the Commissioners passed under the control of the Parliamentary head of the Public Works Department, and to-day all harbor improvements are under the direction of the Engineer-in-Chief. The local Marine Board, of which the late Captain Douglas was first chairman, and Mr. Arthur Searcy is now President, took over and performed for some years the duties discharged by the harbormaster as shipping master; but in 1860 all earlier enactments were repealed, and the Marine Board of South Australia constituted to generally administer marine matters. For years the Government nominated members, but in 1881 that system gave way to semi-election, and at present three members of the board are appointed by the Government, representation being conceded to seamen and engineers; two are elected by shipowners and one each by the Chamber of Commerce and the Marine Underwriters.

Harbor Trust. A Bill has been introduced to Parliament providing for the full control of all wharves and jetties under a trust.

Wages.

Average Wages per Month Paid to Seamen by Sailing Ships and Steamers from South Australian Ports.

	Sailing Ships.			Steamers.		
	Coasting.	Inter-State.	Over-Sea.	Coasting.	Inter-State.	Over-Sea.
	£	£	£	£	£	£
First Mate	£7 to £8	£7 10s. to £8	£10 to £12	£14 to £16	£15 to £17	£9
Second Mate	—	£6 to £7	£7	£12 to £13	£12 to £14	£8
Third Mate	—	—	£6	£10	£10 to £11	—
A.B.	£6 to £6 10s.	£5	£4 to £7	£7	£7	£4 10s. to £5
O.S.	£2 10s. to £3	£2 10s.	£2 to £3	£2 10s.	£3	£2 10s.
Boatswain	£6 10s.	£5 10s.	£6	£8	£8	£5
Sails	—	£5 10s.	£3 to £5	—	—	£5
Carpenter	—	£5	£6	£9	£9	—
Steward	—	£6	£6 10s.	£2 to £11	£3 to £12	£4 to £5
Cook	£7	£6	£6 to £7	£3 to £11	£6 to £12	£6
Cook and Steward	£7	£6 10s.	£7	—	—	—
First Engineer	—	—	—	£18 to £22	£22 to £27	—
Second Engineer	—	—	—	£14 to £17	£17 to £19	—
Third Engineer	—	—	—	£14	£14 to £15	—
Firemen	—	—	—	£9	£9	£4 to £9
Trimmers	—	—	—	£7	£7	£3 to £5



Six Steamers Loading at Wallaroo, an Important Outport.

CHAPTER XXVIII.

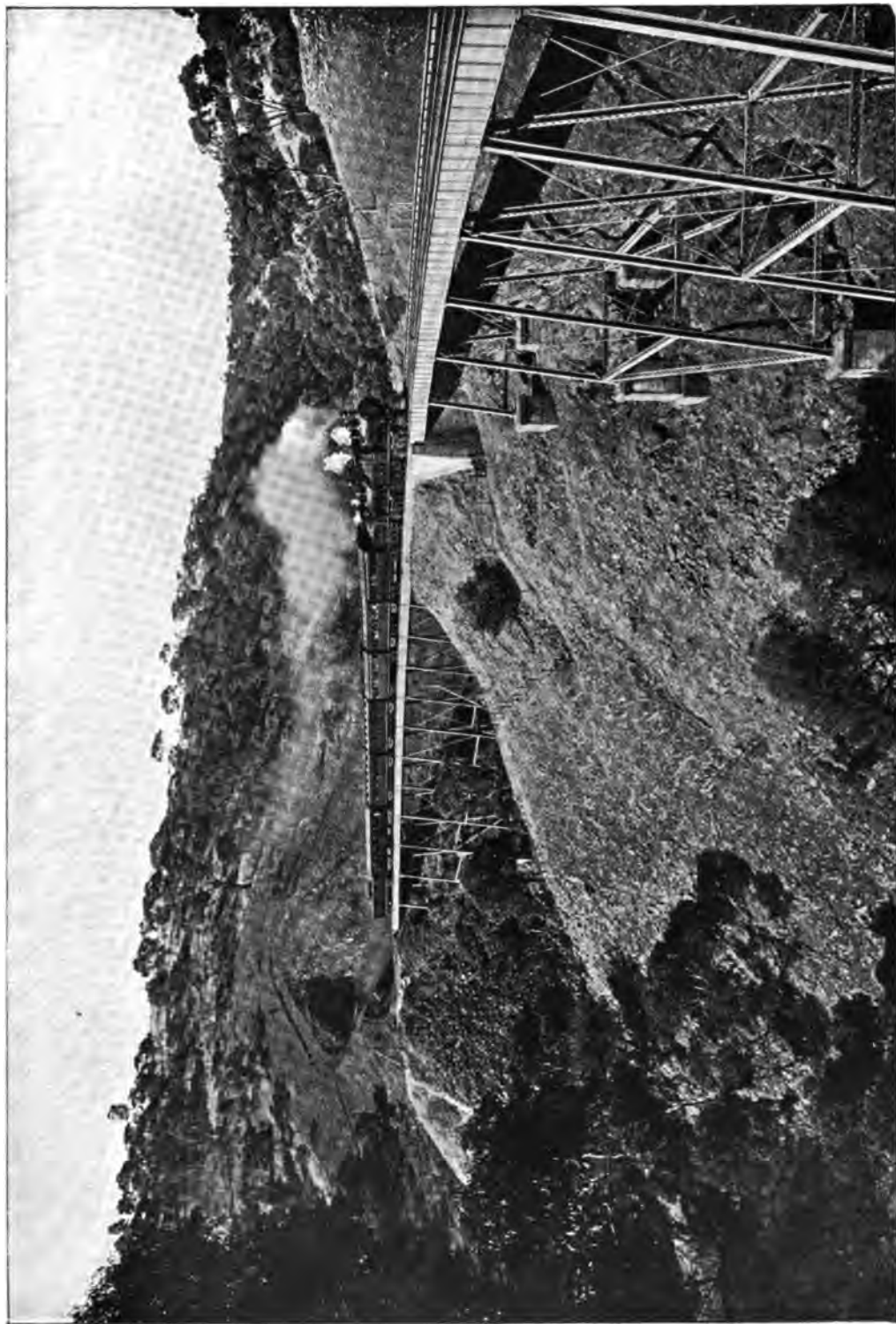
THE STATE RAILWAYS.



THE honor of building the first State-owned railway in the British Empire belongs to South Australia! That claim may sound extravagant, but it can be established beyond doubt. There is another extraordinary fact in favor of this State. In South Australia there are approximately five miles of railway to each 1,000 inhabitants. Compared on that basis, South Australia leads the world as a builder of railways! An influential railway journal admits the accuracy of this, and says—"Comparing the railway mileage of the world, South Australia is first with 52.3 miles for each 10,000 people, this result, of course, being due to the comparative sparseness of the population. In the United States there are 26 miles to 10,000 inhabitants." "Sparseness of population" does not take anything away from so creditable an achievement. The "sparse population" pluckily shouldered the responsibility of running a telegraph line through an unknown continent in order to connect Australia with the world beyond, and boldly adopted a vigorous railway construction policy. In a direct line from south to north there is a clear run by railway—unfortunately with a break of gauge—of over 1,000 miles. The total railway mileage open to public traffic is 1,879 miles, and every inch of it is the property of the people. The only privately-owned line in South Australia is a short span of 33 miles built by the Broken Hill Proprietary Company for the carriage of flux from Iron Knob to the seacoast near Port Pirie. Several new lines are in course of construction.

Progress of Railway Building.

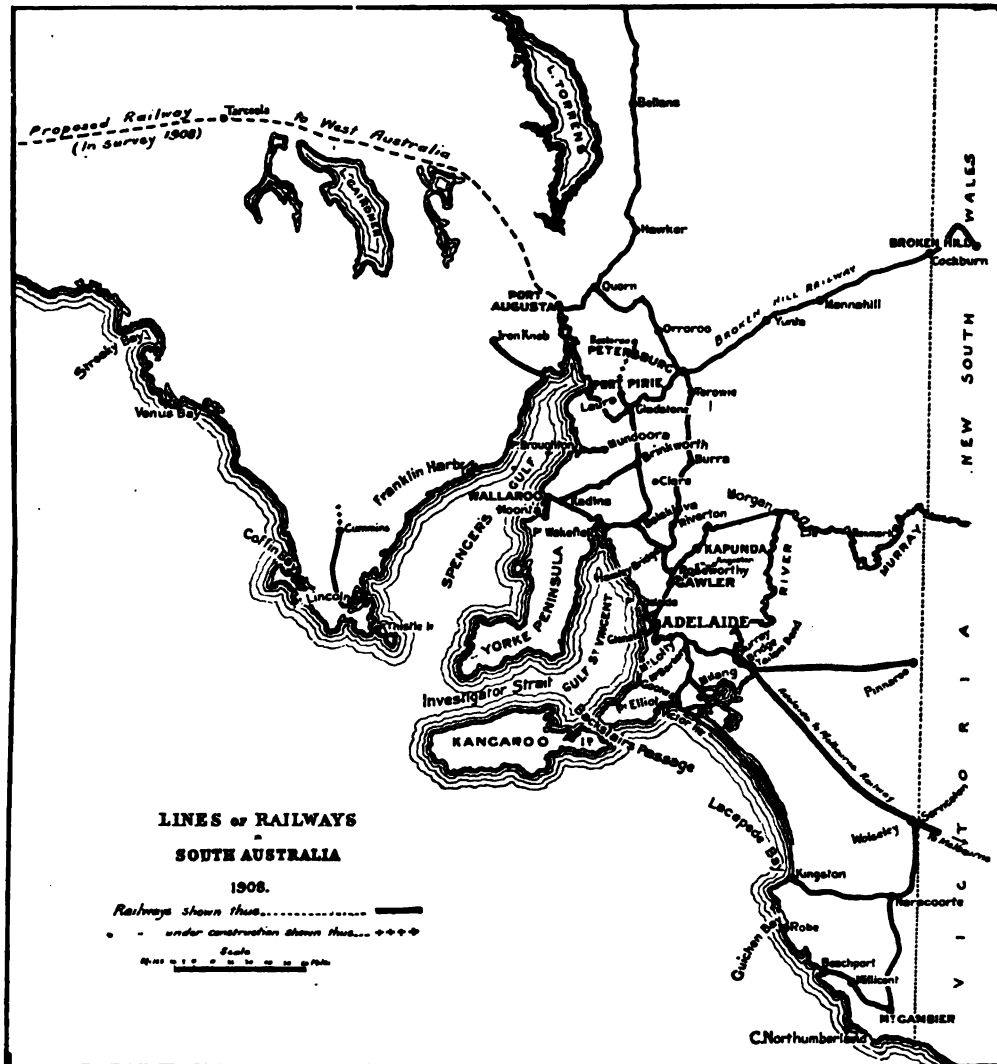
Within 10 years of the proclamation of the province a few pushful pioneers wanted to know why George Stephenson should be supplying locomotive traction to Englishmen and South Australians be left to wield the bullock whip, taxing both their strength and their vocabularies! An agitation began late in the forties in favor of linking the city with the chief seaport. A company was formed in 1848 for that purpose, and legislative authority was given two years later for the construction of a railway from Adelaide to Port Adelaide, "with a branch to the North Arm." The latter was never built. The representative of the company had at least three objections to the terms offered. Maximum tolls of 2d., 1½d., and 1d. for first, second, and third classes were claimed. The Government reserved the right to purchase the line, and a limitation was placed upon the grant of lands. Negotiations were suspended, and the Legislature came forward with a guarantee of 5 per cent. for 10 years on the estimated cost of construction. The company promoters were not satisfied, and the Government stepped in and did the work, thus laying the foundation for the extensive system of State-owned railways in Australia. It was not until April, 1856, that the seven and a half miles of track connecting Adelaide and Port Adelaide was opened as the result of an expenditure of £204,000—or over £27,000 per mile! The next railway in Australia to be opened was a short line in Victoria between Melbourne and Sandridge. Platelayer and bridgebuilder then began to work in earnest in South Australia. They turned their faces northward. The first section was 25 miles to Gawler. That line was opened in 1857, and the little province owned at the end of that year 41½ miles of railway. The next step was to Kapunda, where copper had been discovered. The north-eastern section was available in 1860, and for many years Kapunda remained a terminus, and was greatly frequented by Northern settlers when visiting the city or returning to their homes. For 10 years it represented the "outpost" of the railway system, but in 1870 the copperopolis of South Australia—the Burra (then regarded as being in the Far North)—was connected. The opening up of the Northern Areas a few years later took the "iron horse" to Crystal Brook and Port Pirie. The northward movement steadily continued until Port Augusta, 260 miles from Adelaide, was connected. The two



(CH. XXVIII.)

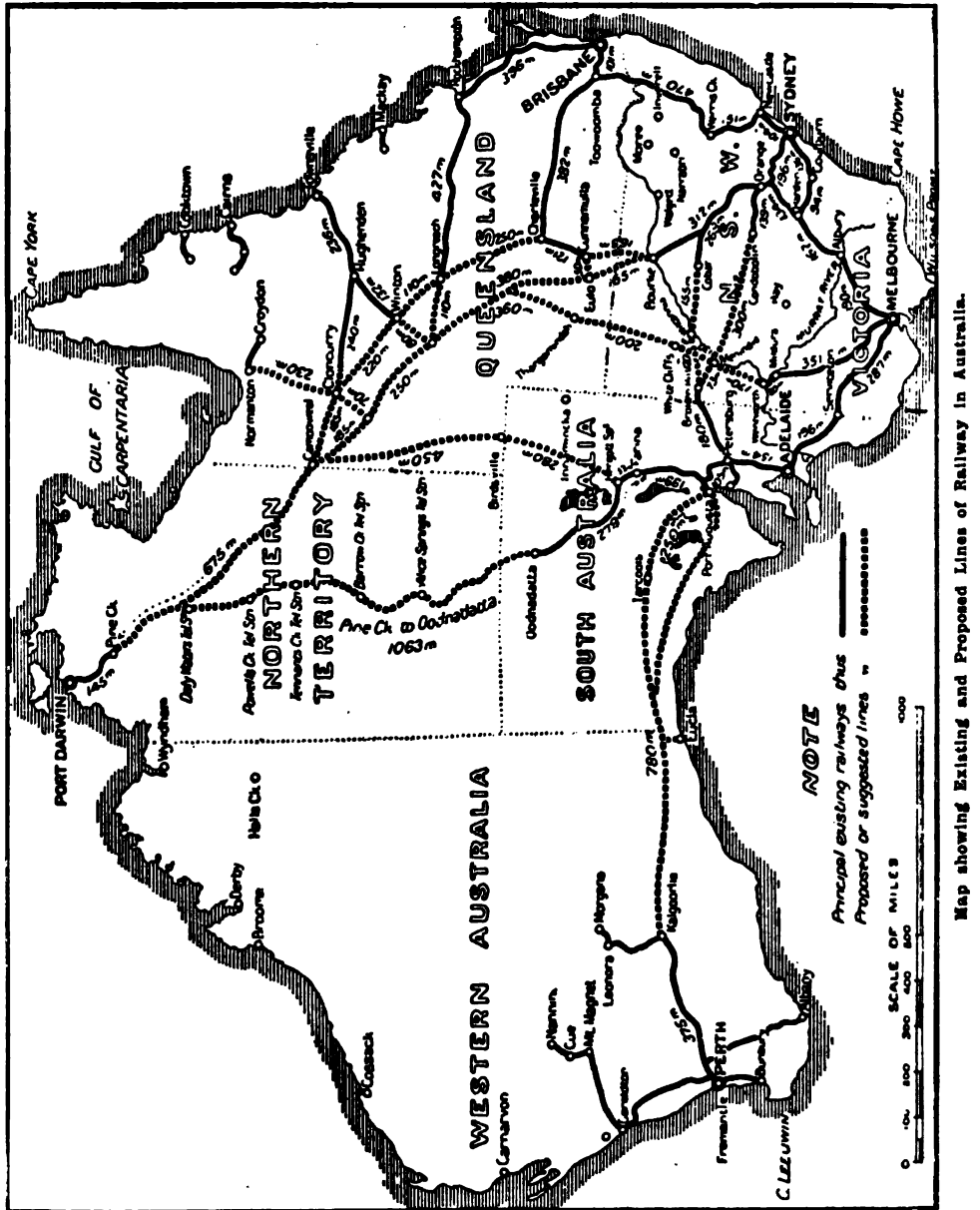
TRAIN CROSSING VIADUCT MOUNT LOFTY RANGES NEAR ADELAIDE.

great engineering feats in connection with railway-building in South Australia were the construction of the Great Northern system, which has its terminus at Oodnadatta, and the line through the Mount Lofty Ranges, across the River Murray, connecting with the inter-State system which now extends to Longreach in Queensland—3,301 miles from Oodnadatta without a gap! The mountain ranges between Quorn and Port Augusta—in which is situated the bold and strikingly grand Pichi Richi Pass—tested the skill of the engineers. Greater difficulties



South Australian System, which comprises 1,300 Miles of Lines.

confronted them in finding a passage through the Mount Lofty Ranges, but they emerged from the ordeal with infinite credit to themselves; and few railways in the world better demonstrate the skill of engineer and workmen than the line which winds its way to high altitudes between Adelaide and Mount Lofty. Nine tunnels aggregating a total length of nearly 2,000 yards and a wrought-iron skeleton-looking viaduct 620ft. long and 108ft. 6in. high were necessary in the first 30 miles. To cross the "Nile of Australia" a bridge consisting of five 120ft. main spars—each containing 140 tons of ironwork—and 23 60ft. spans across a swamp had to be built.



The above map, published by the *Sydney Morning Herald*, shows the main existing lines of railways in Australia (Tasmania excluded) and suggested routes for linking up the States. The Transcontinental aspect of the Australian railway systems is emphasised by the alternative dotted lines between Oodnadatta and Pine Creek, and Mildura, Bourke, and Pine Creek; also the Trans-Australian line joining east and west by the linking of Kalgoorlie and Port Augusta. A preliminary survey of alternative routes between these two points is being made. The impressive lesson conveyed by the map is that, while Australians have built over 14,000 miles of railways at a cost of £137,196,000, the dotted lines indicate the aspirations of Australians to connect outlying districts.

Immunity from Accidents. The Railway Department has a fine record, very few accidents having occurred during half a century of working. In his annual reports the Railways Commissioner has been able to write—"I record with pleasure the fact that no passenger has sustained an injury for which the department could be held responsible, and no better tribute to the general carefulness and attention to duty of the staff can be necessary."

Break of Gauge. Actuated by the very best intention—that of lessening the cost of construction—a dominant section of legislators in the seventies introduced what is known as the narrow gauge, viz., 3ft. 6in., as against the 5ft. 3in. gauge, which was first established. There are three narrow systems in the State separated from one another by the broad gauge. This increases the cost of management. There are breaks from the broad to the narrow width at Hamley Bridge and Terowie, north of Adelaide, and at Wolsley, in the south, and in the event of a glut of traffic in the Far Northern, the Western, or the South-Eastern divisions it is not an easy matter to quickly concentrate hauling power or increase the carrying capacity at a given point. The 5ft. 3in. prevails between Adelaide and Melbourne, and thence as far as Albury, the border of Victoria and New South Wales. In the latter State there is one gauge—the English, 4ft. 8½in. The question of uniformity is one that has frequently been discussed, and as often put aside, because of the divergence of opinion concerning the best width to adopt and the enormous outlay involved in bringing about one common system.

Inter-State Connections. An interesting feature in connection with the South Australian railways was the enterprise of this State in constructing a line to the border of New South Wales to tap the rich Barrier silver fields. The whole of the trade of Broken Hill passes over the South Australian railways. The other inter-State connection is with Victoria, and through that State with New South Wales and Queensland.

Railway Workshops. Splendidly equipped workshops exist at various centres, but the main shops are at Islington, about three miles north of the city. From this establishment locomotives, carriages, and wagon stock are supplied. Some of the most powerful engines in Australia have been designed and manufactured at Islington. The Way and Works Shops, Glanville, under the control of the Engineer-in-Chief, in addition to railway work, are capable of turning out cast-iron piping of various sizes for the reticulation of water.

Trans-Australian Lines. Two projects are before the public at the present time for bridging the continent with railways northwards to connect with the Pine Creek railway, and westward from Port Augusta to join the Western Australian line at the goldfields. The construction of the latter is a matter for the Federal Government, subject to the approval of the South Australian Parliament, to allow the building of a railway through its territory. The cost is estimated in round figures at £5,000,000, and its advocates assert that the work would pay after a few years. It is claimed that the connecting by railway of Perth in the west with Brisbane in the east via Adelaide, Melbourne, and Sydney would be of immense benefit in the expedition of mails, and, if the occasion should arise, the transport of troops. Surveyors are now engaged mapping the route and making estimates of cost. For some time past it has been proposed to extend the Great Northern system of railways. The terminus of that is at Oodnadatta, 688 miles from Adelaide, and between that point and Pine Creek in the Northern Territory there is a gap of 1,063 miles. It is claimed that it will be practicable for passengers and mails to reach Port Darwin by the Siberian railway route in 14 days from London, or in 17 days to Adelaide. A tentative agreement to transfer the Northern Territory to the Commonwealth of Australia may ultimately affect the route of the Transcontinental railway.



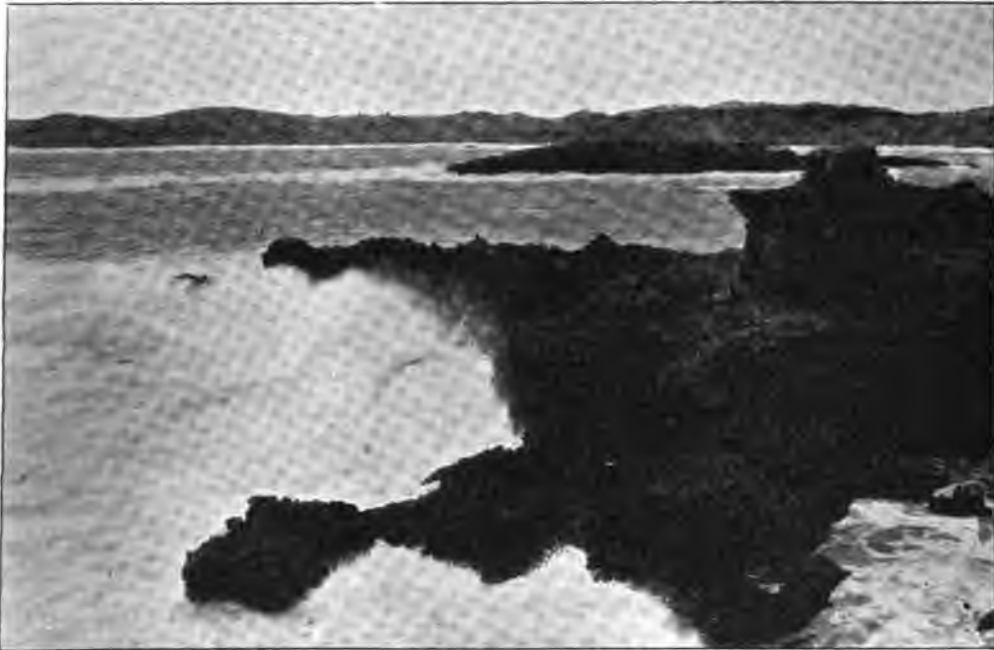
A WATERFALL MOUNT LOFTY RANGE.

Places Worth Visiting Served by the South Australian Railways.

THE HILLS DISTRICT, THE NATIONAL PARK, AND THE SOUTH COAST WATERING PLACES.

The line over the Mount Lofty Ranges passes through beautiful scenery. Where nature undisturbed has ceased to hold sway, art and industry have stepped in, and all along the line, picturesquely dotted about on hillside and in valley, and surrounded by fruit and flower gardens, the majority of which are models of horticultural and floricultural skill and artistic arrangement, are to be found pretty residences, charming villas, and neat cottages. A pleasant day's outing in the midst of lovely surroundings may be enjoyed at any point along the line.

At Belair, 40 minutes' journey from Adelaide, is the National Park, a reserve for recreative purposes, some 2,000 acres in extent. Its exceptional natural advantages have been added to by judicious improvements, under the direction of a board of management. Miniature lakes have been formed, drives and walks laid out, bowers, shelter-houses, &c., &c., erected, so that now visitors find here everything necessary for their pleasure and comfort.



The Rugged Coastline of the South-Eastern portion of South Australia is a Popular Resort of Tourists and Holiday-makers.

After crossing the Ranges the line extends through the districts of Strathalbyn, Black Swamp, Currency Creek, and Finnis to the charming South Coast watering places of Goolwa, Middleton, Port Elliot, and Victor Harbor. The first-named is the nearest station to the Murray Mouth and the Coorong (a favorite resort of sportsmen), and especially interesting as the place at which Captain Sturt, the earliest explorer, after coming down the rivers, reached the sea.

At Middleton there is a fine stretch of shell beach.

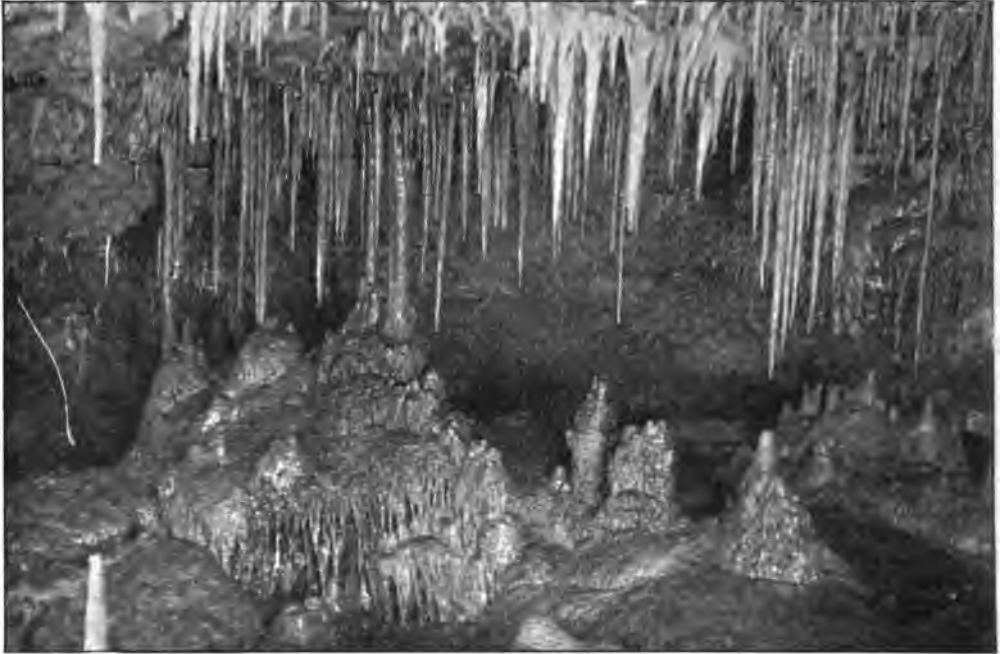
Port Elliot stands second to none in natural attractions for visitors. The never-ceasing roll of the huge breakers of the Southern Ocean, the lovely spray dashing over the fine old granite boulders, and the charming little bays, providing secluded nooks for picnic parties, bears a striking resemblance to New Zealand or New South Wales coast scenery.

Victor Harbor is situated a little further south on the north-west coast of Encounter Bay—the bay of islands, composed of granite boulders—and is a most picturesque place for a summer holiday. Granite Island, the nearest to the mainland, is connected with the town by a long and convenient pier, which forms a delightful promenade. The island itself has many pleasant walks and boulder-shaded nooks, where a summer day may be enjoyably passed. A tram-car runs to the island during the summer months. For geologists this is perhaps the most attractive resort on the continent, signs of glacial action being apparent on the rocks, while the country is strewn with ice-carried boulders.

At each place there are a number of commodious hotels, well-kept and replete with every comfort for visitors, also numbers of boarding-houses, where rooms or board and lodging can be obtained at prices to suit the pockets of all classes.

Boating and yachting may be indulged in either off the coast, on the River Murray at Goolwa, or on the Hindmarsh River, near Victor Harbor. Safe, fast-sailing, little centre-board cutters, manned by capable men who spend their working hours sailing for profit (fishing) and their spare time sculling for pleasure, can be hired for a few hours or a week if required. Excursion steamers take tourists to the mouth of the great river and up stream to various points of interest.

Good fishing is obtainable all round the coast, and in the Murray and Hindmarsh; schnapper, sweep, whiting, mullet, &c., in the sea, and cod, butter-fish, &c., in the river, being often very abundant. The breakers from the Southern Ocean dashing against the granite rocks are an endless attraction.



Laurie's Grotto, Victoria Cave, Naracoorte.

[W. A. Francis, Photo]

THE LAKES, CAVES, AND ROCK-BOUND COASTS OF THE SOUTH-EAST.

Mount Gambier and Environs.—One of the principal pleasure spots in the State is Mount Gambier, with its wonderful crater lakes, many curious caves, and English scenery. The Blue Lake, the most important of the group, is nearly a mile across from east to west. It is surrounded by rocky banks, varying from 200ft. to 30ft. in height, and the water can only be approached at two points by prepared paths. The lake varies in depth from 180ft. to 330ft. The many beauties of the surrounding scenery, the adjoining lakes and caves, and the mountain and view therefrom, and the indigenous flora cannot be here described; but an extended visit to this district will give holiday-seekers considerable enjoyment.

The Glenelg River.—This is one of the most beautiful streams in the southern portion of Australia. Nelson, or "The Punt," about two miles from the mouth of the river, is 24 miles from Mount Gambier, and is reached by a good road the whole length. The banks of the river are in some places rugged and steep, and in others clothed to the water's edge in magnificent specimens of trees, ferns, shrubs, and wild flowers, particularly brilliant in spring and summer. The river is full of perch, bream, salmon, and trout, and duck and other wild fowl abound in large quantities.

Beachport.—This excellent watering-place is reached by rail from Mount Gambier, a distance of 51 miles. The sea being broken by the bars at the entrance to the bay, the water is always comparatively smooth, and boating can be indulged in at all times. There is plenty of fishing and also shooting on lakes George and Frome, and smaller sheets of water adjacent. The Barr Smith steam lifeboat, *City of Adelaide*, is stationed at Beachport; and Penguin Island, with its lighthouse, is easily reached by water.

Robe.—This is another favorite watering-place in the South-East, and is very prettily situated on the southern side of Guichen Bay. Its temperature in summer is said to be the coolest in the State. It is reached from Adelaide by rail to Kingston, and thence by coach; and visitors from the metropolis are numerous during the hot months.

Port MacDonnell.—This watering-place is 18 miles south of Mount Gambier. The seacoast is wild and rocky, but a mile or so inland there are many secluded spots favored by picnic parties. There is a lighthouse at Cape Northumberland, two miles away, and the port contains public sea baths, under good management.

Naracoorte Caves.—The Rev. Julian Woods, F.G.S., &c., &c., after his visit to the caves, said—"In point of magnitude and splendor, and in a scientific view, they do not yield in importance to such wonderful phenomena as the Adelsberg Caves, the caves in the Peak of Derbyshire, the Guarcharo Caves, and those in New South Wales and Tasmania." Alighting from the train at Naracoorte, the caves are reached after an eight-mile drive. No description can convey an adequate idea of their vastness and the natural wonders to



Opening to Third Chamber, Old Cave, Naracoorte.

[W. A. Francis, Photo

be found there, but all travellers should visit these subterranean phenomena. A specially interesting cave, which was discovered a few years ago, has recently been opened to the public. It is near the others, and is in a perfect state of preservation, the careful oversight of the Woods and Forests Department, under whose control the caves are placed, preventing the mutilation of the beautiful stalactites with which it is studded. Applications must be made to the resident forester for permission to visit this cave, a charge of 1s. being collected from each visitor. The Government has recently spent some hundreds of pounds in improving the facilities for visiting the caves. As they become better known they will rightly take their place as one of the show sights of the Australian States.

THE WORLD-FAMED BARRIER MINING FIELDS, AND SOME PLACES OF INTEREST NORTH OF ADELAIDE.

Rail communication between the Barrier Fields, New South Wales, the seaboard, and Melbourne, Sydney, and Brisbane, is given via the Silverton Tramway (33 miles) and the S.A. Railways (Adelaide 299 miles, and Port Pirie 219 miles). There is a daily express (14 hours) in each direction between Adelaide and Broken Hill; sleeping cars are attached for the night journey—berth fee, 7s. 6d.; and adequate refreshment-room accommodation is to be found at convenient points.

Port Augusta.—This township is within a day's journey of Adelaide, and that portion of the country between Quorn and Port Augusta, through Pichi Richi Pass, in the Flinders Range, with Mount Brown (3,200ft. high) frequently in view, is extremely picturesque. Port Augusta is at the head of Spencer's Gulf, one of the finest waterways in Australia. The town is healthily situated, and contains many fine buildings. First-class hotel accommodation is provided, and the port offers a most enjoyable holiday to those fond of yachting and fishing.

Gawler and Angaston.—Visitors should certainly see this charming district the home of the vine. Gawler, often termed the "Colonial Athens," is 25 miles from Adelaide, and five trains a day run to it. It is an exceedingly pretty town, situated on the banks of the South Para River, and two large iron foundries give the town a busy appearance. Continuing the journey north-east through Rowland's Flat, Tanunda, and on to Angaston and Schlunke's Creek, a most fertile tract of country is passed through, teeming with vineyards. These towns will shortly be connected by railway. At present passengers alight from the train at Freeling or Gawler. Another well-known place is the Roseworthy Agricultural College, about seven miles from Gawler; in fact, the whole of this district is interesting, the scenery beautiful, and the roads good.

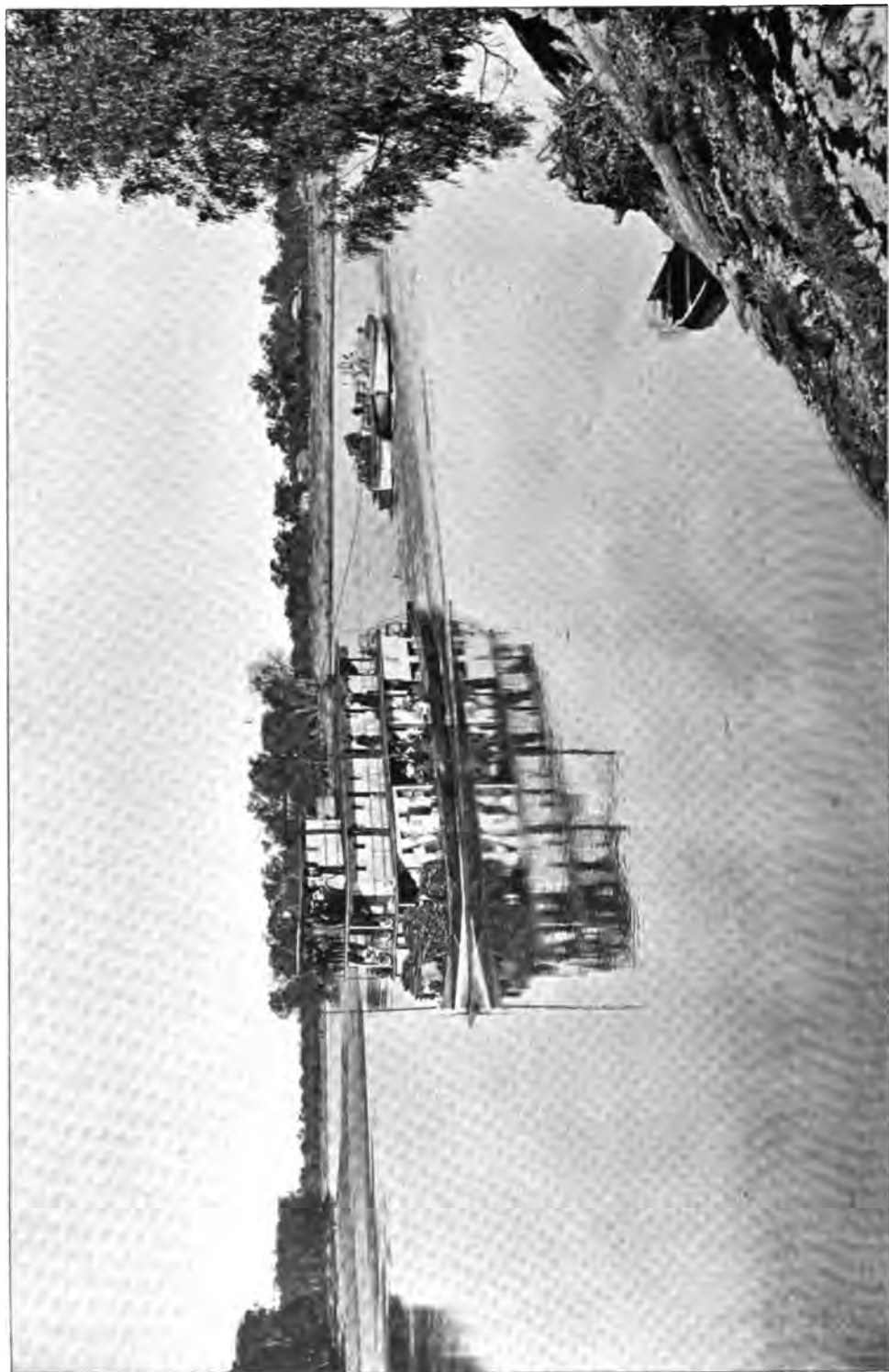
Clare.—Alighting at Saddleworth, Clare is reached by a 22-mile drive over an excellent road and through delightful scenery. After passing Auburn the road thence to Clare follows the windings of the River Wakefield.

Commencing 13½ miles to the westward of the Laura Railway Station, tourists may drive or cycle through Wirrabara Plantation and Forest and the Telowie Gorge, *en route* to Port Germein, amidst scenery both varied and picturesque. The Telowie Gorge is very fine.



A View of Hill River Estate, near Clare.

[A. Vaughan, Photo.]



THE GATEWAY OF THE INTERIOR.

The River Murray and its Tributaries are Navigable for a Distance of 2,000 Miles. South Australia Opened the Murray to Navigation in 1883.

(Chas. P. Scott, Photo.)

CHAPTER XXIX.

FINANCE AND TRADE.

THE pioneers of South Australia were more bent upon subduing the wilderness and establishing homes for themselves and their children than they were in inaugurating any elaborate system of government. Still, it soon became necessary to institute some form of public finance, and as early as 1837 South Australia's "general expenditure" amounted to £5,283. It was 12 months later before the province enjoyed a public revenue, and for years the amounts on this side of the account fell below the outgoings. It is not the purpose here, however, to write a financial history of South Australia. The record is one of a struggle for popular rights, with its sidelights of comedy and tragedy. More than once it seemed as if the infant settlement would come to grief on some financial rock, but the determination and common sense of the early settlers prevailed. South Australia enjoys to-day what some older countries lack—financial autonomy. The power of the purse is in the hands of a representative Chamber elected on adult suffrage; there can be no taxation without representation.

An expenditure of close on £3,000,000 sterling per annum **Public Expenditure.** may seem at first sight a lavish outlay for a community of about 400,000 souls, but it must be remembered that large sums of money are required by the Government for the purpose of carrying on public services which elsewhere are performed by private enterprise. No better idea of the extent to which this is true can be gained than by analysing the main items of expenditure during the financial year which ended on June 30th, 1907. The figures are as follows :—

Head of Expenditure.	Amount. £
Interest on public debt.	993,388
Reduction and redemption of public debt	87,553
Railways	863,773
Education (including grants to educational bodies)	184,578
Public works (chiefly maintenance) and main roads	142,718
Police	76,433
Hospitals, asylums, destitute, and State children	92,775
Gaols, law courts, &c.	33,898
Grants-in-aid to local government	33,238
Legislature	31,675
Marine Board	26,286
Printing	24,602
Produce Export Department	15,827
Department of Agriculture	12,834

the following figures suggest the quarter from which South Australia derives the main portion of her revenue. An income corresponding to an expenditure of £3,000,000 would be impossible if it had to be raised solely by taxation. The public undertakings, however, provide the Treasurer with the

greater part of his cash. In the following is shown the main sources of revenue during the financial year to June 30th, 1907, with the percentage of each to the total :—

Head of Revenue.	Total. £	Per Cent.
Railways	1,552,919	49
Taxation (exclusive of Customs)	408,156	13
Rents of land, &c.	228,805	7
Waterworks	123,568	4
Total	£2,313,448	
Returned by Commonwealth	627,102	19
All other revenue	254,735	8
Grand total	£3,195,285	100

The absence of any reference to posts and telegraphs and defence in the foregoing is explained by the fact that these departments have been taken over by the Commonwealth. Posts and telegraphs yielded an income in 1906-7 of £327,268, and cost £252,539 for ordinary outlay and £25,695 for new works. Defences accounted for an expenditure of £87,776, and returned a revenue of £255.

Federal and State Finance. From 1838 to 1907 the total general revenue of the State amounted to £91,035,449, and the general expenditure to £92,394,006. Federation has altered the basis of State finance, inasmuch as the taking over by the Commonwealth authorities of the Customs house upon the establishment of inter-State free-trade deprived the State of its second largest revenue-earning department. In 1899—before Federation—the total revenue amounted to £2,665,477, of which no less than £907,504 was derived from taxation, the Customs having been responsible for £597,846. In 1907 out of a total of £3,195,285 taxation was responsible for only £408,155. The difference was rather more apparent than real, since it is provided in the Federal compact that up to 1910 three-fourths of the receipts through the Customs shall be handed back to the States. During the financial year to June 30th, 1907, the amount so returned by the Commonwealth Treasurer was £627,102, and since the total Customs duties actually collected in South Australia, including a small amount for the Northern Territory, during that period was £781,926, it will be seen that the people of South Australia were taxed to a greater extent than appears by the State accounts. It must be remembered, therefore, that the proportion of revenue received by means of taxation, as indicated earlier, refers only to State and does not include Commonwealth taxation. The form of taxation adopted by the State is—Income tax (proceeds in 1906-7, £163,930), land tax (£89,990), stamp duties (£74,636), probate and succession duties (£60,204), licences (£19,396).

Public Debt. It is not possible to understand South Australian public finance without reference to the system of borrowing, which was inaugurated in 1854. At latest date the public debt of the State stands at £30,473,968, inclusive of borrowings amounting to £3,867,470 on account of the Northern Territory, for which the southern part of the Central State is responsible. To the European critic Australian obligations appear to be abnormally large. There is an important distinction, however, to be drawn between the national debts of European countries and those of Australia. In the one case loans have disappeared in smoke, having been employed chiefly for war purposes. In these lands Government borrowings have been undertaken for the construction of railways, harbors, waterworks, telegraphs, and in other revenue-earning works. If offered for sale these assets would bring considerably more than the amount borrowed for their construction. In the light of these facts there is nothing appalling in an indebtedness per head of £79 9s. 7d., or in an interest charge of £2 12s. 4d. *per capita* chargeable to South

Australia proper, and of £2 17s. 8d. including Northern Territory interest. This is how the money which has been borrowed for South Australian undertakings has been invested, together with the return per centum from the revenue-earning departments :—

Loans Raised For—		Capital Cost, including Maintenance Charged to Revenue.	Earnings for Year 1906-7.	Cost of Maintenance, Management, etc., for Year 1906-7.	Per Centage of Net Profit over Working Expenses on Capital Cost.
Undertaking.	Amount.				
	£	£	£	£	
Railways	13,752,445	13,699,029	1,575,368	868,005	5.16
Telegraphs and post offices .. .	1,011,567	—	—	—	—
Waterworks .. .	5,004,986	4,748,633	123,171	37,880	1.79
Sewers .. .	696,422	663,941	41,043	12,494	4.30
Jetties and lighthouses .. .	211,593	427,384	33,838	14,782	3.99
Improvements on pastoral leases ..	1,066,500	973,992	9,795	986	1.11
Land repurchased for homestead blocks ..	726,469	836,029	31,044	510	3.6
Vermin-proof fencing .. .	319,681	300,590	8,383	905	2.81
	22,789,663	21,649,598	1,822,642	935,562	4.09
Roads and bridges .. .	1,497,885	} These undertakings not being directly reproductive, and in some cases in progress, the net profit cannot be given.			
Defences .. .	316,919				
Drainage, &c. .. .	324,492				
Harbor improvements .. .	1,711,741				
School buildings .. .	552,369				
Other works and buildings .. .	425,396				
Aid to revenue .. .	1,699,925				
Redemption of public securities .. .	4,926,533				
Municipal Tramways Trust .. .	294,850				
	34,539,773				
Northern Territory .. .	3,807,470				
Total borrowed .. .	38,407,243				
Less redeemed .. .	£2,745,725				
Reissued and cancelled .. .	5,187,550				
	7,933,275				
Public debt on July 1st, 1907 .. .	£30,473,968				

Another way of regarding the matter is to see what burden the public debt of the State actually throws upon taxation, for if some of the undertakings upon which borrowed money has been expended are revenue-earning it is clear that they are not responsible for taxation. Money has to be raised in this way to assist in meeting interest, redemption, and cost of general administration. The position, as it appeared in the financial year to June 30th, 1907, was that the interest payment on account of the South Australian debt proper was £993,388, or including the Northern Territory, £1,105,823. The earnings of the eight undertakings on which borrowed money had been spent, and which showed a profit over working expenses, were £1,822,642. The cost of maintenance and management of these eight undertakings came to £935,562, so that there was a surplus of £987,080, which was almost sufficient to meet the interest charge on the total debt. The rest of the undertakings, on which close on £12,000,000 of borrowed money has been expended, are not directly revenue-producing, so that the interest must be made up some other way. It will be seen from this that there is most approved security for the payment of interest on South Australian debt, as well as for the investment of the money. The Customs receipts per head of the population amounted in 1906-7 to £2 0s. 9d., the average of land tax receipts per taxpayer were £1 10s., and of income tax £8 14s. 1d. Total taxation (including Customs) per head of population was £3 1s. 9d. It is always difficult to arrive at the taxable capacity of any people, but it will not be advanced

that, the limit in South Australia has been reached when, according to Coghlan, the value of private property per head is £234, and has more probably increased than decreased since the computation was made. Taxation per head of the population in other States in 1905-6 was—New South Wales, £3 Os. 7d.; Victoria, £2 14s. 7d.; Queensland, £3 3s. 6d.; Western Australia, £5 1s. 4d.; Tasmania, £3 3s. 7d.; so that South Australia shows well by comparison.

Repaying Loans. Reference to South Australia's policy of public borrowing—the “broad and comprehensive” policy of erstwhile legislators—would not be complete without a word as to the provision which exists for repaying loans as they fall due. When South Australia first entered the money market as a borrower the form of security adopted was 6 per cent. bonds, the money having been required for the city and Port Adelaide railway. This rate of interest continued to rule till 1871, when it became possible to borrow at 5 per cent., and the tendency since has been to enjoy the advantage of lower interest charges. Up to 1866-7 £1,135,000 had been borrowed, and the whole of this has been redeemed out of revenue. Other loans since contracted for have been either in whole or in part (mostly the latter) redeemed out of revenue, the total amount which has been thus dealt with to date having been £2,745,725. Some other loans as they have become due have been reissued as consolidated stock and Treasury bills, the total having amounted to £5,187,550. Still, South Australia is only now having to seriously face the repayment of debt. In 1907 there fell due in London £1,000,000 of 4 per cent. bonds, and the Treasurer was in the happy position of being able to discharge £818,600 in cash, while the balance was, at the option of the holders, reinvested in $3\frac{1}{4}$ per cent. inscribed stock. In January, 1908, a further £500,000 became due in London, and again the State met its obligation, and paid nearly the whole in cash, allowing those who desired to do so to take up South Australian stock. The splendid seasons which are being experienced are rendering the work of redemption comparatively easy, but those who in the past have been unkind enough to suggest that Australia would repudiate when it suited her should know by now that such an idea is altogether foreign and repugnant to the self-governing people of these parts. In 1908-9 the most important redemption will take place—£5,098,750, most of which was expended on railways. Between 1907-8 and 1916-17 South Australia will have to meet £12,793,150, of which £8,735,300 is represented by bonds and £4,057,850 by Treasury bills. It is unlikely that the whole obligation will be discharged. In 1877 the Imperial Government passed the Colonial Stock Act, which provided for the inscription and transfer of stock raised in the United Kingdom. Certain steps were necessary to be taken before advantage of this Act could be enjoyed, but in 1882 South Australia passed the Inscribed Stock Act. In 1896 a sinking fund was established, and $\frac{1}{4}$ per cent. of the principal of the public debt has since then annually been set aside out of revenue. To date the sum of £662,063 has been “earmarked” in this way. Then it is provided that all surpluses on the year's finances shall be similarly devoted, and certain receipts have been set aside for the same purpose. The aggregate made available from all sources for the redemption of debt since that date is £1 230,088.

A clear understanding of the public finance of South Australia **A Trading People.** furnishes the key to an insight into the position of the State as a trader. Imports were first made in 1838, and exports went out the same year. To date total trade has amounted to over £550,000,000—truly a prodigious total. In the early years exports of domestic produce were naturally comparatively small, and the requirements of the settlers had to be drawn to a considerable extent from other parts. With the increasing productiveness of the virgin lands, however, shipments attained greater dimensions, and now for many years the balance has been on the side of exports. To arrive at an understanding of South Australia's trading account it must be remembered that she is a debtor country. Imports have to be paid for by exports, but in addition interest on public and private indebtedness has to be remitted to London, and freight on inward and outward goods has to be paid oversea. In years when public borrowing was proceeding merrily the effect was shown in swollen imports, the proceeds of loans having been sent out in the shape of material and goods. Now that the rate of borrowing has slackened, and almost the only



appeals that are being made to the London money market are for redemption purposes, imports represent more nearly ordinary trade purchases abroad. In the circumstances it will be seen that there will be an excess of exports. In the following is shown the trade position over 10 years :—

DECENNIAL RETURN SHOWING TOTAL IMPORT AND EXPORT TRADE, AND BALANCE OF TRADE, &C., OF SOUTH AUSTRALIA.

Year.	Total Import and Export Trade.	Total Imports.	Imports retained for Home Consumption.	Imports Re-exported	Total Exports.	Exports Produce of the State.	Balance S.A. Produce Exported over Imports Consumed.	Balance Imports Consumed over S.A. Produce Exported.
	£	£	£	£	£	£	£	£
1896	14,754,824	7,160,770	2,836,328	4,324,442	7,594,054	3,269,612	433,284	—
1897	14,054,800	7,126,385	2,682,110	4,444,275	6,928,415	2,484,140	—	197,970
1898	12,980,579	6,184,805	1,878,040	4,308,765	6,795,774	2,487,009	610,989	—
1899	15,272,754	6,884,358	2,441,007	4,443,351	8,388,396	3,945,045	1,504,038	—
1900	16,063,709	8,034,552	3,615,912	4,418,640	8,029,157	3,610,517	—	5,395
1901	15,387,477	7,371,588	3,572,300	3,799,288	8,015,889	4,216,601	644,301	—
1902	13,772,296	6,073,782	3,144,215	2,929,567	7,698,514	4,768,947	1,624,732	—
1903	14,919,072	6,618,627	3,475,701	3,142,926	8,300,445	5,157,519	1,681,818	—
1904	16,115,716	7,450,716	4,515,821	2,934,895	8,665,000	†5,730,105	1,214,434	—
1905	17,930,276	8,439,609	4,980,561	3,459,048	9,490,667	†6,031,619	1,051,058	—
1906	21,635,435	9,702,264	5,208,934	4,493,330	11,933,171	†7,439,841	2,230,907	—

NOTE.—Northern Territory included from 1904.

† Estimated as regards proportion of Inter-State transfers.

Who South Australia Trades With.

Including the movement of goods inter-State, South Australia's total trade, which reached high-water mark in 1907, was equal to £67 8s. 4d. per inhabitant. Even if it be allowed that large quantities of ore from Broken Hill—which geographically is in New South Wales, but commercially belongs to South Australia—merely pass through the State on the way to foreign markets, the result is not altered to any material extent. Including the population of Broken Hill in that of South Australia, the value of total trade still represented over £60 per inhabitant. Even as transit trade, and it is by no means all such, South Australia's inter-State dealings are of great importance. The record for 1907 was as follows :—

	Imports from—				£	Exports to—				£
Commonwealth	7,304,593	..	..	..	..	5,798,852
United Kingdom	3,060,416	..	..	..	..	3,762,823
Foreign countries	1,192,113	..	..	..	..	2,838,101
British possessions	562,930	..	..	..	..	1,369,618
Total	£12,120,052	..	..	..	..	£13,769,399

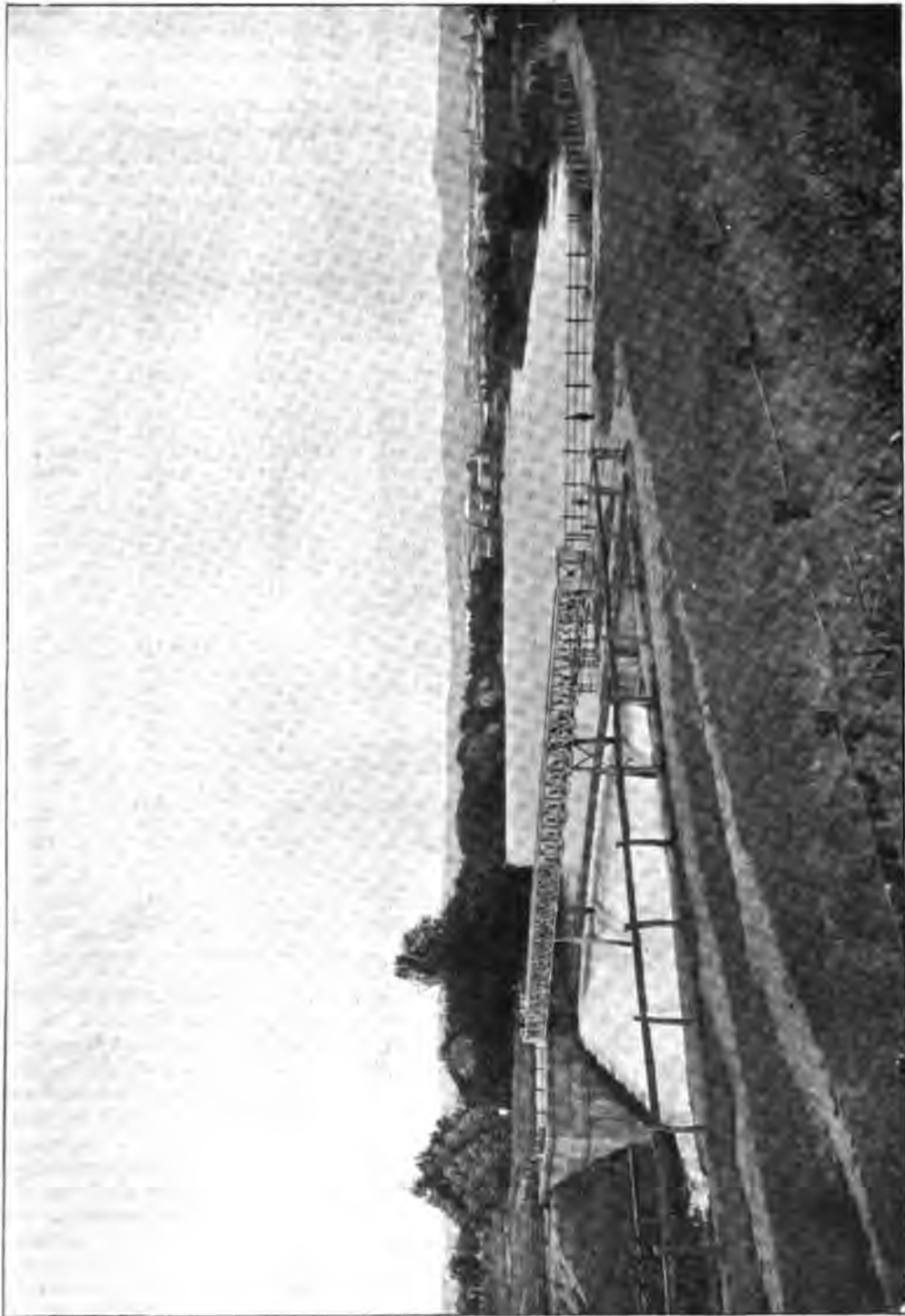
Deducting trade done with other parts of the Commonwealth, South Australia's imports from overseas were valued last year at £12 10s. 9d. per inhabitant, and exports at £20 15s. per head. Again, excluding transit goods, and taking into consideration only exports of South Australian

produce oversea—valued in 1907 at £5,424,213—the value per inhabitant was £14 2s. 6d. As a trader, therefore, South Australia has something of which to be proud. South Australian goods enter nearly every civilised country, but the bulk of the trade is done with the United Kingdom, as the following, setting out the main destinations of domestic produce in 1907, will make clear :—To United Kingdom, £3,498,485 ; foreign countries, £1,157,083 ; British possessions, £768,645. London acts as a distributor of this State's produce, especially wool, to quite an important extent, but almost every year sees some progress in the direction of connecting the State direct with the chief markets of the world. South Australia's record as a trader over 70 years is as follows :—Imports, £275,488,058 ; exports, £298,107,859 ; staple exports, £193,681,563 ; total trade, £573,595,917 ; total in 1838, £165,024 ; total in 1907, £25,889,451 ; annual average value, £8,194,227.

Imports and Exports Classified.

As showing the class of goods which South Australia is importing the following table of imports (not distinguishing those retained for home consumption) is useful :—

	1905.	1906.	1907.
	£	£	£
Apparel and all soft goods	959,985	1,093,625	1,401,483
Ale and beer	26,408	37,946	41,998
Boots and shoes	33,884	36,749	44,217
Clocks and watches	28,912	32,797	39,338
Cocoa and chocolate	18,967	27,136	30,311
Coffee and chicory	7,760	9,054	10,159
Confectionery	9,481	10,644	14,008
Cordage and twines	45,570	55,136	66,047
Drugs and chemicals	46,251	75,686	78,659
Earthen and china ware	23,099	25,919	36,881
Fish	34,815	38,021	38,736
Furniture	21,780	23,855	31,815
Glassware	26,897	32,025	39,222
Hats and caps	40,905	51,937	53,036
Indiarubber goods	22,440	32,825	38,194
Iron and steel	214,607	297,239	375,689
Jewellery	54,517	80,101	83,501
Jute goods	166,703	272,133	253,358
Kerosine	30,517	58,273	53,895
Leather, &c.	35,658	45,121	37,574
Machinery—			
Agricultural	51,424	46,181	109,499
Other	164,605	261,631	324,316
Manures	145,486	127,100	116,107
Metals—Manufactures of	245,442	306,685	438,010
Milk, preserved	12,385	12,509	11,646
Paper	80,979	89,563	104,114
Paints, &c.	21,122	33,015	31,917
Rice	17,669	17,228	23,216
Spirits—			
Brandy	11,554	11,143	13,783
Gin	6,321	8,043	9,379
Whisky	43,248	48,135	50,341
Tea	87,030	100,191	130,516
Tinplates	15,652	22,059	24,710
Tools of trade	29,554	43,515	57,465
Tobacco, manufactured	9,749	8,664	9,457
Tobacco, unmanufactured	10,210	7,908	10,028
Cigars	8,578	9,751	9,882
Cigarettes	2,359	2,516	2,510
Timber (rough)	104,495	113,909	188,680
Timber (dressed)	23,153	33,933	52,980
Vehicles	56,823	75,570	76,470



Weir and Torrens Lake, showing Parliament House and Mount Lofty Range in the Distance.

[T. McGinn, Photo.]

The export of South Australian produce and manufactures during 1906 and 1907 is shown in the following :—

STAPLE EXPORTS.

	1906.		1907.	
	Quantity.	Value.	Quantity.	Value.
		£		£
Horses (No.)	355	7,054	623	14,844
Bark (tons)	1,786	16,141	1,043	9,637
Butter (lbs.)	1,806,134	89,279	1,623,944	79,855
Copper ingots (tons)	2,829	236,526	3,739	335,579
Copper in matte (tons)	1,135	88,314	233	22,363
Eggs (doz.)	20,663	689	59,348	1,982
Fodder (tons)	832	2,737	96	323
Fruits, dried (lbs.)	15,827	350	713,578	10,082
Fruits, preserved	—	1,658	—	1,034
Apples (centals)	35,067	26,883	10,361	9,728
Grain and pulse—				
Beans and peas (centals)	864	252	435	105
Oats (centals)	680	196	4,731	1,476
Wheat (bush.)	12,037,744	1,968,531	12,613,165	2,152,842
Flour (tons)	57,961	421,271	49,427	403,920
Bran and pollard (centals)	2,860	686	674	161
Oatmeal, &c. (lbs.)	390,100	1,357	4,000	16
Gum (cwts.)	18,060	3,261	17,202	4,750
Hair (lbs.)	36,682	2,327	24,633	2,898
Hay and chaff (tons)	85	235	121	382
Honey (lbs.)	12,595	146	53,720	577
Jams and jellies (lbs.)	582	10	2,760	34
Meats, preserved—				
Frozen mutton and lamb (lbs.)	8,614,360	132,996	9,898,118	170,028
Rabbits and hares (prs.)	242,006	10,413	185,982	8,273
Tinned meats (lbs.)	996,504	13,309	21,600	360
Salt (tons)	7,218	10,693	3,550	5,180
Hides (No.)	3,311	2,709	4,591	4,003
Rabbit skins (lbs.)	1,014,280	46,755	842,747	35,006
Sheepskins (No.)	1,117,591	336,072	1,392,995	385,204
Other skins	—	7,107	—	5,741
Soap (lbs.)	571,853	3,781	391,800	2,856
Brandy (galls.)	2,973	754	2,764	709
Wine (galls.)	230,339	23,985	353,381	31,989
Tallow (cwts.)	18,952	25,027	30,663	45,657
Beeswax (lbs.)	4,439	280	3,548	211
Wool, greasy (lbs.)	38,741,059	1,328,706	46,629,943	1,823,146
Wool, scoured (lbs.)	2,513,560	150,072	2,391,935	155,948

The net balance of South Australian produce exported over imports retained for home consumption has averaged for the past decade about £1,000,000 sterling annually. If there were no withdrawals or importations of capital, imports over a series of years should balance exports, after provision had been made to meet interest on public and private indebtedness, freights, and other charges. As, however, debt has been increased during the past 10 years, and it is almost impossible to arrive at the freight charge, it is not possible to do more than generalise on this aspect of the subject. As long as South Australia offers such undoubted security for the investment of capital, and no difficulty is experienced by bondholders in getting their money at the due date, a reasonable addition to public debt need occasion no adverse comment. It is worth noting, though, that, particularly of recent years, disposition has been shown to carry a portion of the debt locally. Redemption is not being wholly effected out of revenue, but by providing the Treasurer with funds from the local market. The only alteration is the substitution of local in place of London creditors. Of an interest bill of £1,138,160 the

sum of £287,285 is now payable in Adelaide, and as long as the market for commercial undertakings is not prejudicially affected by local borrowings there is something to be said in favor of South Australia carrying a portion of the principal of her debt. Such has, of course, been rendered possible by increasing prosperity, which has added to local resources. Since the banks afford one medium of measuring the liquid resources of a country a little attention may be given to these institutions. There are seven banks of issue carrying on business in South Australia. The only local establishment is the Bank of Adelaide, which since its inception has had a remarkably successful career. The others are the Union Bank of Australia, National Bank of Australasia, English, Scottish, and Australian Bank, Commercial Bank of Australia, Bank of New South Wales, and Bank of Australasia—all of which have a London office. The head office of the Bank of Adelaide is in Adelaide, and the London office is at 11, Leadenhall Street, E.C. The following table shows the amount of public money at fixed deposit and current account, total advances, and excess of total deposits over advances:—

	Current Accounts.	Fixed Deposits.	Advances.	Excess Deposits over Advances.
	£	£	£	£
1900.				
June 30 .. :	2,681,980	3,201,873	4,137,985	1,826,054
Dec. 31	2,481,007	3,251,543	4,244,528	1,537,913
1901.				
June 30	2,475,836	3,339,105	4,226,553	1,720,820
Dec. 31	2,312,778	3,476,942	4,272,816	1,631,105
1902.				
June 30	2,272,573	3,481,549	4,327,830	1,571,869
Dec. 31	2,268,316	3,523,234	4,262,522	1,658,108
1903.				
June 30	2,460,227	3,658,197	4,332,700	1,945,865
Dec. 31	2,297,912	3,598,011	4,345,348	1,700,715
1904.				
June 30	2,270,685	3,619,778	4,305,735	1,748,297
Dec. 31	2,256,511	3,858,606	4,531,793	1,765,830
1905.				
June 30	2,233,742	4,121,066	4,693,804	1,871,797
Dec. 31	2,395,418	4,277,088	4,877,761	1,593,717
1906.				
June 30	2,684,565	4,346,179	4,933,503	2,261,397
Dec. 31	2,878,536	4,352,077	5,305,871	2,179,373
1907.				
June 30	3,169,238	4,522,350	5,428,532	2,504,660
Dec. 31	3,186,907	4,776,387	5,499,168	2,664,797

An excellent institution in South Australia is the Savings Bank, established in 1848, "for the encouragement of frugality, and that persons possessing small sums of money beyond what they required for the supply of their immediate wants, should be afforded an opportunity of depositing the same on good security to accumulate at interest." That the bank has more than accomplished the most sanguine intentions of the founders will be admitted when it is mentioned that in 60 years 42 in every 100 persons in the population have become possessed of an account with the bank. The following figures, taken from the report and balance-sheet to June 30th, 1907, are eloquent of progress and thrift on the part of the people:—Transactions per diem during the year, 1,780; depositors (with accounts bearing interest), 139,670; (with accounts not bearing interest), 22,185; amount deposited in year, £2,872,517; amount repaid, £2,462,704; amount at credit of depositors (with accounts bearing interest), £5,304,704; (with accounts not bearing interest), £16,167; average amount to credit of each depositor, £37. 19s. 7d.; invested on mortgage at end of year, £1,465,591; invested in Government securities, &c., £3,124,603; average rate of expenses to total funds. 6s. 4½d. per £100. As

regards the amount of deposits per head of population South Australia leads the world. The following table of deposits and withdrawals during the bank year to June 30th reflects the growing prosperity of the State and the greater disposition of the people to save :—

								Deposits.	Withdrawals.	Excess Deposits.
								£	£	£
1897	..	..	..	..	..	..	..	1,685,636	1,593,567	92,069
1898	..	..	..	..	..	..	..	1,561,782	1,589,763	*27,981
1899	..	..	..	..	..	..	..	1,699,193	1,600,196	98,997
1900	..	..	..	..	..	..	..	1,832,368	1,696,373	135,995
1901	..	..	..	..	..	..	..	1,918,708	1,727,806	190,902
1902	..	..	..	..	..	..	..	1,985,689	1,903,664	82,025
1903	..	..	..	..	..	..	..	2,159,347	2,078,423	82,924
1904	..	..	..	..	..	..	..	2,021,106	2,117,896	*96,790
1905	..	..	..	..	..	..	..	2,110,977	2,070,222	40,755
1906	..	..	..	..	..	..	..	2,450,331	2,233,775	225,556
1907	..	..	..	..	..	..	..	2,872,517	2,462,704	409,813

* Excess withdrawals.

Deposits reached high-water mark last year, as did also withdrawals. This is a testimony to the popularity of the bank as well as an evidence of good times and active trade. The largest class of depositors is that with deposits not exceeding £20. The Savings Bank is essentially the small man's bank, but it is also something better—it is the children's and young people's bank. Deposits will be taken down to 1s., and special provision is made for opening accounts in the name of infants and minors. The bank has just been empowered to establish penny banks, and steps are being taken to encourage school children to deposit their savings. In the following table is shown the disposition of depositors' savings during the past three years :—

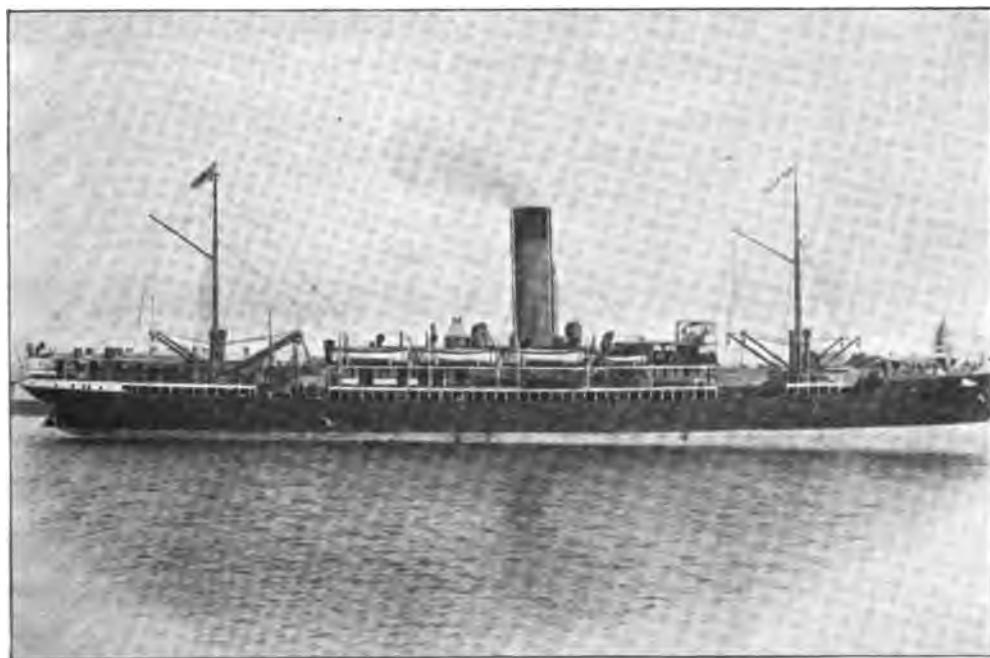
						1905.		1906.		1907.	
						Accounts.	Amount.	Accounts.	Amount.	Accounts.	Amount.
							£		£		£
To £20	..	..	..	..	..	88,619	347,474	90,905	351,944	94,612	394,103
From £20 to £50	..	..	..	..	..	13,840	432,737	14,533	466,719	15,935	504,415
From £50 to £100	..	..	..	..	..	8,987	623,349	9,585	666,388	10,441	721,856
From £100 to £150	..	..	..	..	..	5,229	630,367	5,465	663,413	5,969	723,398
From £150 to £200	..	..	..	..	..	3,058	525,879	3,273	565,050	3,599	621,915
From £200 to £250	..	..	..	..	..	2,934	654,434	3,241	727,316	3,781	844,057
Over £250	..	..	..	..	..	4,154	1,166,117	4,047	1,308,362	5,333	1,403,360

The State Bank. The State Bank was established by the State Advances Act of 1895, under which it was authorised to lend to producers to the extent of three-fifths of the value of their properties as determined by the bank's valuers. Advances were also authorised to be made on Crown lands, and by a subsequent Act power was given to make advances on any freehold property irrespective of whether the borrower was a producer or not. Subsequently the legislation regarding loans on Crown lands was liberalised. The bank is not permitted to lend more than £5,000 to any one person, nor must advances current at any one period exceed £3,000,000. Money is raised by the issue of mortgage bonds, payment of interest and principal being guaranteed by the Government, and these bonds are redeemable by ballot after five years' currency. The bank also has power to purchase mortgage bonds instead of balloting for their redemption. The maximum rate of interest allowed to be charged to borrowers is 5 per cent. per annum, and the maximum currency of a loan is 42 years. All loans are repaid by equal half-yearly instalments, which include interest at the rate agreed upon, hitherto 4½ per cent., and a portion of the principal. Borrowers have the right at any time to make repayment of principal in excess of the amount included in the instalment, or they may repay the whole advance. In cases

where excess payments are made a corresponding reduction of interest is allowed by the bank. The following table will show at a glance the operations of the State Bank from its inception up to the date of the last balance-sheet, March 31st, 1907 :—

ADVANCES AND REPAYMENTS SINCE THE STATE BANK'S INCEPTION IN MARCH 1896.

Period.	Advances.	Repaid.	Balance Outstanding at End of Year.
	£	£	£
Five months—June, 1896	30,425	2	30,423
One year—June, 1897	231,595	2,007	260,011
Nine months—March, 1898	110,500	9,709	360,802
One year—March, 1899	91,632	32,137	420,296
One year—March, 1900	65,729	31,474	454,551
One year—March, 1901	90,824	37,967	507,408
One year—March, 1902	92,023	62,525	536,905
One year—March, 1903	81,280	56,441	561,745
One year—March, 1904	95,967	55,071	602,641
One year—1905	35,095	55,522	582,214
One year—1906	86,038	65,887	602,365
One year—1907	98,251	86,886	613,730



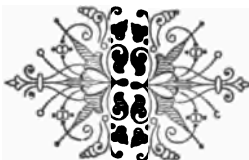
The Adelaide Steamship Company's s.s. "Grantala," one of the Popular Inter-State Passenger Steamers of the Line.

The total mortgage bonds sold to date, bearing interest at $3\frac{1}{2}$ and 4 per cent., is £1,083,150, of which £490,550 have been redeemed. The total advances to the end of the financial year 1907 amounted to £1,233,264, and the repayments £601,853. Altogether advances have been made to 5,618 persons, and of those there are now about 3,500 on the bank books. The amount of principal that has become due under instalments is £211,992. Of this sum £201,890 has been paid, leaving £10,101 in arrear. That shortage is accounted for by the fact that many of the

loans were taken for brief periods, and that borrowers found the instalments heavier than they could meet. Although they are in arrears in connection with a portion of their principal, however, the persons concerned have in almost every case made considerable reductions in the amount of the loans originally granted to them. The sum which has accrued for interest during the 12 years of the bank's existence aggregates £250,267; £249,595 of this has been paid, leaving only £672 in arrears—roughly one-tenth per cent. To meet the requirements of the bank, mortgaged bonds have been sold to the amount of £1,187,660; and of these redemptions to the extent of £596,580, leaving bonds current on March 31st £591,080. The total funds of the bank amount to £650,429, and the surplus to the credit of profit and loss is now £30,000, of which approximately £4,000 are the profits on the operations of the past year. The total losses made by the bank since it was formed in 1896 are £586, and this total has been deducted from the profit and loss account. At present the bank has only one property on its hands, and the rent which is being collected from it is more than sufficient to pay instalments on principal and interest. The greater number of advances have been made on country freehold lands, and next upon town freehold lands. The bank is managed by a paid board of five members appointed by the Government. In addition to an annual audit of the accounts by two auditors appointed by the trustees, subject to the approval of the Treasurer, the Commissioner of Audit examines the accounts and makes an annual report to Parliament.

South Australia's prosperity is due chiefly to the development of primary industry. In the following is shown the number of persons engaged in agricultural, pastoral, and other productive pursuits in South Australia at the time of the last census, in 1901. The total population at that date was 362,604, and total breadwinners 153,296. Since the census was taken the population has increased to 400,000.

Classification of Occupation.	Persons.	Percentage of Population.	Percentage of Breadwinners.
Primary producers—			
Agricultural	34,186	9.43	22.30
Pastoral	7,001	1.96	4.61
Mining	6,301	1.74	4.11
Other primary producers	1,613	.44	1.05
Total	49,101	13.57	32.07
Industrial—			
Manufacturing	24,924	6.87	16.26
Building and construction	8,836	2.44	5.76
Indefinite	7,473	2.06	4.88
Total	41,233	11.37	26.90





HIS MAJESTY'S MAIL COACH IN THE BACK BLOCKS NEGOTIATING A RIVER BANK.

[CHAS. P. SCOTT, PHOTO.]

(CH. XXX.)

CHAPTER XXX.

FACTS ABOUT 'SOUTH AUSTRALIA.

Area and Government.

SOUTH Australia was proclaimed a province under the British Crown on December 28th, 1836, and was granted self-government in 1857. The first session of the first elected Parliament was opened on April 22nd, 1857. The State became a member of the Commonwealth of Australia on January 1st, 1901. The Legislature now consists of a Legislative Council, with 18 members elected on a property franchise, and a House of Assembly, with 42 members elected on an adult franchise.

South Australia, including its dependency the Northern Territory, contains an area of 578,361,600 acres, and stretches through the heart of the continent from the Southern Sea to the Indian Ocean. The area of South Australia proper (excluding the Northern Territory) is 243,244,800 acres, which has been disposed of as follows :—Sold and selected (exclusive of land repurchased and leased for homestead and closer settlement), 7,812,636 acres ; sold closer settlement lands and homestead blocks, 2,983 ; sold with covenant to purchase, 1,132,849 ; held on lease with right of purchase on June 30th, 1907, right of purchase leases, Act 444, 1888, etc., 4,618,588 ; scrub leases, 66,038 ; homestead leases, 26,881 ; leases for pastoral purposes, 77,431,430 ; miscellaneous leases, 1,341,712 ; grazing and cultivation lands, 67,463 ; selectors' leases, 67,165 ; reserved lands (within schedule B to Act 393, 1886), 28,086 ; perpetual leases, 11,994,989 ; homestead (perpetual lease), 10,999 ; aboriginal leases and licences, 505,476 ; mineral (including gold) leases, 33,725 ; granted for University, schools, &c., 58,481 ; forest reserves, 164,113 ; Renmark Irrigation Trust, 30,000 ; Agricultural College endowment lands, 50,000 ; unoccupied land (including lakes), 137,805,186.

The State has a coastline of 2,000 miles, and numerous fine outports exist where produce is loaded into ocean-going vessels.

There is a population of approximately 400,000. Births, in 1907, numbered 9,209, and deaths, 3,736.

Adelaide, the capital of South Australia, is known as the "Queen City of the South," and is one of the best laid out, cleanest, and most beautiful cities of the world.

Citizens enjoy a large measure of political freedom. For the Commonwealth Parliament elections every man and woman of 21 years of age has a vote. For the State Parliament elections every man and woman has a vote for the House of Assembly. There is a property qualification for the Legislative Council. This was recently reduced to a basis of £17 per annum rental value.

The power of both Houses of Parliament is co-ordinate, excepting that Bills for appropriating any part of the revenue, or for imposing, altering, or repealing taxation must originate in the Assembly.

South Australia was the first State to introduce a fine system of local self-government by means of Municipal Corporations and District Councils. These bodies, in addition to having control over streets and certain roads, are vested with considerable local authority. In addition to fostering the important principles of self-government, the plan has encouraged self-help among people in remote districts, and has had the effect of lightening the labors of the State Legislature regarding matters of local concern, whilst relieving the central government of much detail administration.

A travelling American journalist wrote in 1907—"If I had the choice of the most picturesque there would not be any doubt that Adelaide would rank first. It is in some respects the most beautiful place I have visited. I recall but one—Vienna—that has such a magnificent park system. If Adelaide ever has 300,000 or 400,000 people it will attract the attention of the world."

The public debt stands at £30,473,968, or £79 9s. 7d. *per capita*. The interest bill amounts to £993,388, or £2 12s. 4d. per head. The money raised by borrowing has been expended as follow:—Railways and tramways, £13,752,445; telegraphs and post offices, £1,011,567; waterworks, &c., £5,004,986; sewers, £696,422; jetties and lighthouses, &c., £211,593; improvements on pastoral leases, £1,066,500; land repurchase and homestead blocks, £726,469; vermin-proof fencing, £319,681; roads and bridges, £1,497,885; defences, £316,919; drainage, &c., £324,492; harbor improvements, £1,711,741; school buildings, £552,369; other works and buildings, £425,396; aid to revenue, £1,699,925; redemption of public securities, £4,926,533; municipal tramways trust, £294,850; Northern Territory, £3,867,470.



Punt Across the River Murray.

The greater portion of borrowed money has been devoted to the construction of interest-bearing public works.

South Australia possesses about 1,900 miles of railways, which have cost over £13,000,000. Earnings during the year to June, 1907, were £1,575,368, and working expenses £868,005; passenger fares came to £370,983; parcels, luggage, and mails, £81,295; and goods and live stock, £1,083,504. The percentage of expenditure to revenue was 55.10 per cent., which was the lowest for 10 years, and the percentage of net revenue to capital cost was £5 3s. 2d., the highest for the decade. Minerals earned £398,841 for the railways last year; coaching, £452,278; and goods, £480,660. The gross tonnage carried over the railways last year was 2,042,931 tons.

During the past 20 years South Australia has enjoyed surpluses on all but three occasions, aggregating £1,926,000, while deficiencies have been £338,698. During the past three years surpluses to nearly a million sterling have accumulated, and the money has been devoted to reduction of debt, enabling a saving to be made in interest of £40,000.



There was a surplus of £297,673 on June 30th, 1907, on the year's operations. The credit balance devoted to the redemption of public securities. The surplus for the year ending June, 1908, was £480,000.

South Australia's total private wealth is estimated at £94,468,000, or £260 per head of the population. This amount *per capita* is higher than the United States, Canada, France, New Zealand, Switzerland, Argentine, and is only exceeded by two other Australian States.

The average bequest per adult dying in South Australia is £507—the largest, with one exception, of any of the Australian States.

No less than 42 persons out of every 100 of the population have accounts with the Savings Bank. The amount deposited last year was £2,872,517; amount withdrawn, £2,462,704; depositors' balances at end of year, £5,320,871, or an average of credit of each depositor, £37 19s. 7d. The revenue of 1907-8 was greater by £460,000 than that of 1906-7.



View in Botanic Garden, Adelaide.

South Australia leads the world in thrift. Savings Bank deposits amount to £2,872,517—an increase of nearly £2,000,000 in 20 years.

Including companies there are 19,140 payers of income tax in South Australia, and the average amount paid was £8 14s. 1d. There are 60,102 land tax payers, and the average is £1 10s. There are 626 absentee land tax payers, and the average tax paid last year was £3 1s. 2d. The cost of collecting land and income tax last year was £5 3s. 8d. per cent. The net income brought into account in income tax returns for 1906 was £7,080,590, compared with £8,447,043 in 1905.

A 21 years' financial review—revenue, £55,821,274; ordinary expenditure, £35,281,288; interest, £18,392,506; total expenditure, £53,673,794; surpluses, £2,486,178; deficiencies (three), £338,698; set aside out of revenue to meet redemption and reduction of debt, £2,269,435; grand total expenditure, £55,943,229; deficits for which securities have had to be issued, £500,750.

South Australia is absolutely solvent. Apart from the indisputable security for money borrowed for public purposes there is every year a substantial balance of exports over imports, thus representing ability to pay interest and freight charges.

The climate of South Australia is one of the best in the world. There is to be found the maximum of genial sunshine.

A Charming Climate. Nature smiles on the healthy man, and he experiences the full joy of living. Sunless days are rare.

Winter has no terror for man or beast. It neither depresses nor destroys. It invigorates and cheers.

The mean temperature of the three winter months is—June, 53·5; July, 51·5; August, 54·0.

Many successful South Australians have journeyed to England or other European countries to spend their remaining years, but have found the climate so depressing compared with that of the southern land that they have returned to the State.

The healthiness of the climate is indicated by the low death rate, which in 1907 was 9·72 per 1,000 of the population, as compared with 15·5 in the United Kingdom, 19·6 in France, 19·6 in the German Empire, 21·7 in Italy, 23·7 in Austria, 25·9 in Spain, and 27·8 in Hungary for the year preceding.

The system of drainage adopted in Adelaide is a model for the Commonwealth. Even after heavy rains little concentration of water is to be seen. It is facilitated by the contour of the roads. It is carried away to the river by a huge network of gutters and channels. The city of Adelaide is one of the best drained and one of the cleanest in the world.

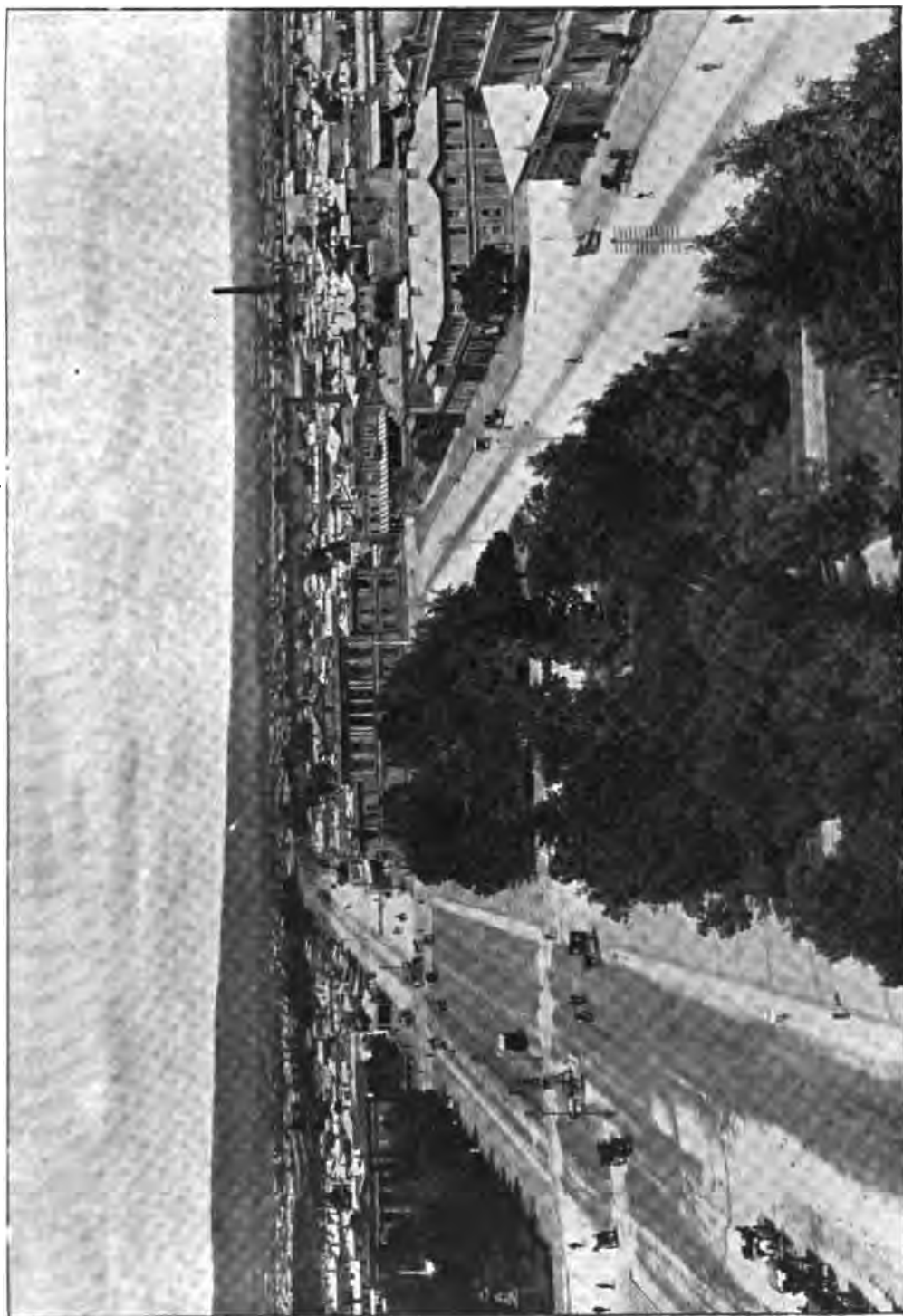
Infant life thrives in South Australia. The death rate of infants in 1906 was 7·58 per cent. of births registered, as compared with 13·78 in England as the mean of the five years ended 1905.

The glorious natural conditions of climate are aided by intelligent methods of public hygiene. Epidemics of serious sickness are rare, because they are watched for and dealt with at the outset.

The Rev. E. G. Gange, F.R.A.S., who visited Australia in 1907, wrote on his return—“Adelaide, the capital of South Australia, is surrounded by a belt of park lands, so that children, invalids, or athletes have not to trudge long distances to find an open space; but, striking out from centre to circumference in any direction, this zone of health is quickly found, with its carpet of grass and canopy of trees, where men can rest or indulge in athletic sports without let or hindrance.”

This is the opinion of a distinguished visitor after an extended visit to the State—“There is no more delightful land than South Australia in its wealth of natural products and beautiful scenery Nowhere else in the world, perhaps, are there any more beautiful sunsets than those which are to be seen as one looks out over the Gulf of St. Vincent from the Mount Lofty Ranges. This is indeed an ideal place for peace, quiet, rest, and meditation. The summer climate of these hills is incomparable. The air is always cool and of a fresh, light, sparkling purity that makes breathing a tingling delight. The sky is usually so clear, and there is such an affinity of depth in its brilliant blue that it seems higher than the sky of our northern latitudes, while at night the moon and stars rain down upon the earth a golden fire that touches tree and shrub, hill, valley, and plain with a strange magic that transforms them into a scene of indescribable mystic beauty. The spirit of a child of God, as he stands upon these South Australian hills and looks up into the glorious radiance of these summer skies at night, cannot but be filled with awe and adoration for the great Father and Creator. It is never too dry in the South Australian hills; it is never too hot; it is never too cold; and in the summer time at least it is never too wet. Consequently almost anything can be grown here, and the gardens are almost of tropical luxuriance. About ten miles to the north-west of Mount Lofty lies the city of Adelaide, with its suburbs—a city which is, in some respects, the most beautiful of the three capitals of the Australian States that we have seen. South Australia's daily newspapers enjoy the unique distinction of being the fairest secular press in the world.”

In “The Great Outposts of the Empire” the author, Wilson le Couteur, describes his arrival at Port Adelaide thus—“The large number of oversea and inter-State ships lining the wharves, the unloading of great cargoes from the homeland, the thousands of tons of bagged wheat in



View of the City of Adelaide, looking South through Victoria Square.

huge stacks awaiting shipment, the great flourmills with their incessant hum, trains passing and repassing—passenger and goods laden—made up a scene of such activity as to surprise the future colonists, who had evidently discounted what they had heard, but now wore smiles of gratification at its truth. Later on, when they took train to Adelaide, the capital, seven and a half miles distant, and gazed on the beautiful city, with its long, tree-ornamented, wide thoroughfares, in rectangular lines broken at intervals by wide garden-bedecked squares, all scrupulously well kept, with the whole overlooked by imposing stone structures, their amazement knew no bounds. Returning after a lapse of five years, I was much struck with the signs of prosperity observable on all sides. . . . I must here declare, as many others have before me, that once an Australian—either born or by adoption—an irresistible desire possesses you to return, roam you never so far.” Incidentally Mr. le Couteur mentions that South Australia has the giant’s share of stone habitations of all the States in the Commonwealth.

The Live Stock Industries.

Live stock as well as human beings thrive remarkably under the sunny skies of South Australia. The housing of animals is unnecessary, and in no country is less artificial feeding required. South Australia is the home *par excellence* of the sheep, and her stud stocks are in great request for the improvement of flocks elsewhere. A sheepfarmer in another State had his fleeces doubled in weight in ten years through introducing South Australian blood.

Climatic and pasture conditions so aid the sheepbreeder that he has produced some wonderful results. Forty-five years ago the average fleece on a certain station was between 5lbs. and 6lbs. Now it averages from 11lbs. to 13lbs., and lately a flock of wethers sold for shipment to Western Australia yielded the enormous average of 16lbs. 14½ozs. !

Heavier fleeces and better prices are causing owners to secure more money for their clips. Wool now contributes about a million and a half sterling to our exports ; the total for the current season will be nearer £2,000,000.

Horses, cattle, pigs, and poultry thrive equally as well as sheep.

The pastoral industry is estimated to represent an annual value of over £3,000,000. The State owns 6,829,634 sheep, 344,671 cattle, 208,639 horses.

South Australia owns some of the highest class stud sheep, cattle, and horses to be found in Australia. “South Australian stud Merino sheep are the best in the Commonwealth,” said a European authority after an extensive tour of inspection.

The breeding of lambs for the export trade has become an extensive industry. Exports have grown from practically nothing 10 years ago to nearly 300,000 carcasses in one season.

A typical South Australian Merino sheep is an animal of large symmetrical frame and robust constitution, carrying a heavy fleece of long staple, strong in character, possessing lustre and softness.

The fact that neither sheep nor cattle need to be housed, and that artificial feeding is not necessary, enables a great saving to be made in the cost of breeding live stock in South Australia. The country is well adapted to the raising of high-class sheep, cattle, and horses.

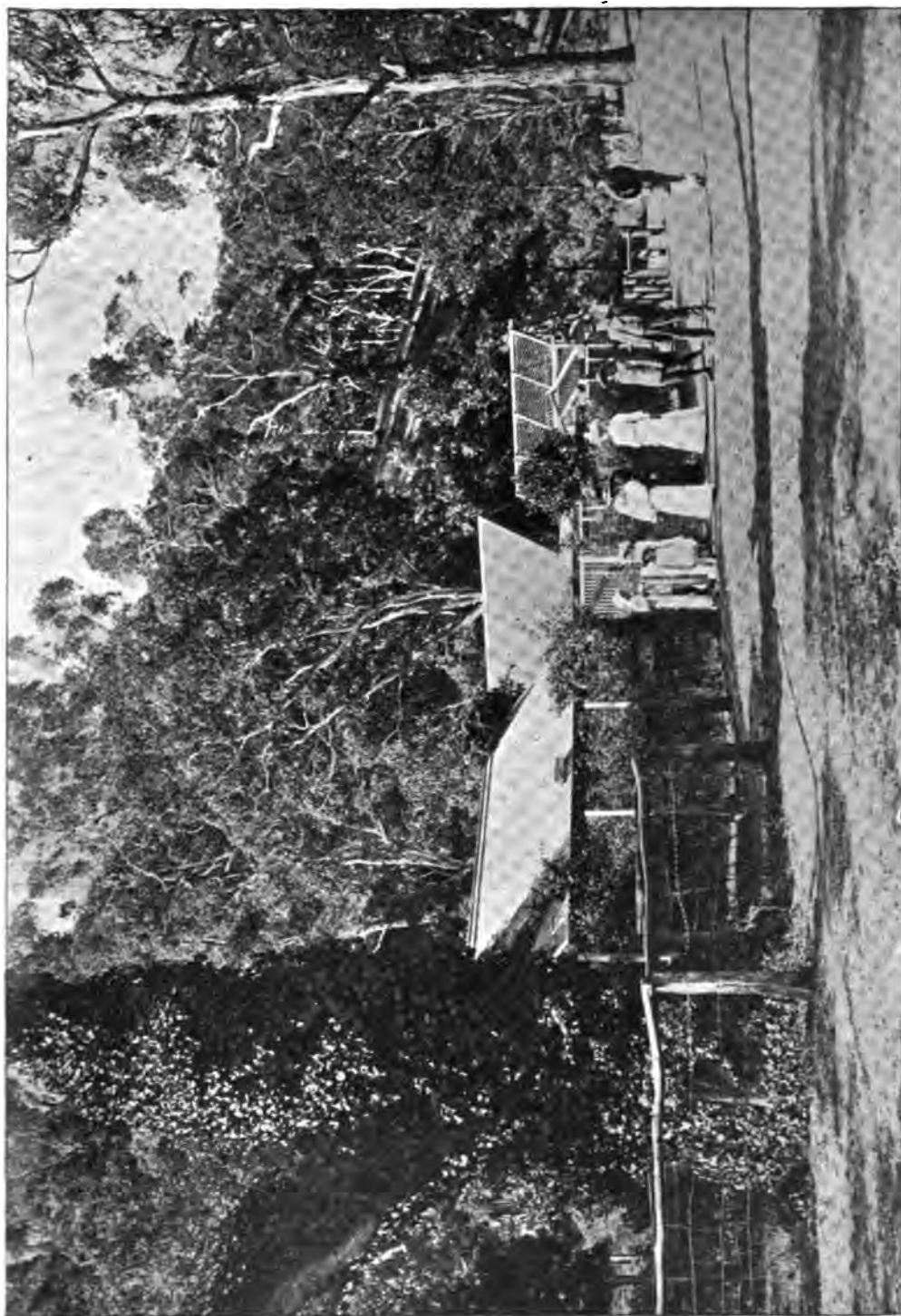
The “largest horse sale held in the world” took place at Kapunda, South Australia, during October, 1908 ; over 2,500 animals were sold.

Large numbers of South Australian horses were purchased for military purposes in South Africa during the war, and big drafts of remounts are annually bought for India.

South Australia has an annual total trade of just on £24,000,000. Trade and Imports in 1907 were valued at £12,120,052, and exports £13,769,399. Production. The first shipments of South Australian produce were made in 1838.

Minerals were first exported in 1841, wheat and flour in 1843. The total value of staple produce exported to the end of 1907 amounted to £193 681 563.

South Australia exported in 1907 to places beyond Australia—WOOL, to the value of £1,979,094 ; WHEAT and FLOUR, £2,556,762 ; COPPER, £357,942 ; WINE, 31,989. Wool sold at the Adelaide sales in 1907 amounted to 119,815 bales.



IN THE NATIONAL PARK, NEAR BELAIR MOUNT LOFTY RANGE.

[J. Marshall, Photo.]

The annual primary production of the State is estimated to reach £7,895,000, towards which agriculture contributes £3,861,000, pastoral and dairying £3,443,000, poultry £591,000. Mining products are valued at £652,545, forests £205,000, and manufactures £2,600,000, with a total annual production of £11,352,545. Since these figures were compiled, "total production" is computed at £13,000,000.

Some market values of production — Cereals, £4,010,326; pastoral (exports, 1907), £2,556,448; breadstuffs (shipped, 1907), £2,974,860; hay, £1,523,448; orchards and gardens, £668,054.

"Owing to favorable conditions of cultivation," says Mr. Coghlan, in his "Seven Australasian Colonies." "a yield of 7bush. per acre in South Australia is financially as satisfactory as one of 15bush. in New South Wales, or of 20bush. in New Zealand."

South Australia, in 1907, had an area "under cultivation" of 3,239,891 acres. There were 1,681,982 acres under WHEAT, 295,875 acres under HAY, 57,000 acres under OATS, 28,122 under BARLEY, 17,985 under FODDER CROPS, and 23,679 under GRASSES.

The State possesses some of the finest orchards and orange groves in Australia. There are 22,575 acres devoted to VINEYARDS, 18,199 acres ORCHARDS, and 8,379 acres GARDENS. Trees in bearing include APPLES, 755,930; ORANGES, 161,200; LEMONS, 65,955; ALMONDS, 199,413; OLIVES, 83,153; VINES, 10,599,712.

South Australia produced, in the season 1906-7, WHEAT, 17,145,796bush.; HAY, 395,766 tons; OATS, 896,166bush.; BARLEY, 491,246bush.; WOOL, 126,000 bales; WINE, 2,441,504galls.; RAISINS, 16,123cwts.; CURRANTS, 23,281cwts.; APPLES, 311,538 cases; ORANGES, 114,150 cases; LEMONS, 37,378 cases; ALMONDS, 7,010cwts.; OLIVE OIL, 16,161galls.; POTATOES, 22,277 tons; PEAS, 140,367bush.; WATTLE BARK, 7,274 tons; HONEY, 1,088,489lbs.; BUTTER, 8,873,632lbs.; CHEESE, 1,398,785lbs.

South Australia was awarded the gold medal for wheat against the world at the great Exhibition of 1851, and the gold medal for the best collection of fruit at the Exhibition of the Royal Horticultural Society of Great Britain, and of the Royal Botanical Society of London in 1906.

South Australian farmers were the first in Australia to use artificial manures in the cultivation of cereals. In 1896 600 tons were employed, but in the seeding season 1907 no less a quantity than 68,000 tons was used.

In 1898 250,000 acres were manured for cereal crops; in 1908 1,456,000 acres.

"South Australian wines," says the State Viticulturist, "are undoubtedly superior to the bulk of the European wines, and are, therefore, well able to hold their own on the markets of the world."

"Some of the best wines I have tasted in Australia were those of South Australian production."—Viscount Des Garets, a champagne-maker of Epernay, France.

In 1861 the production of wine was 182,087galls. In 1907 the "make" was nearly 3 000 000galls. The vines "in bearing" in 1897 numbered 6,807,000, in 1907.

There is a large extent of mineral country in South Australia. Copper-mining is conducted on an extensive scale.

A State forest system was inaugurated in 1875, and at the present time 190 000 acres are devoted to forestry.

South Australian enterprise opened the River Murray to navigation in 1853, and it is now proposed to lock this stream in order to make it permanently navigable. Settlement is increasing in the valley of the Murray, which offers a splendid opening to men with a little capital.

Agriculture has been a foremost factor in contributing to the State's prosperity.

Not till the early seventies did the land under cultivation exceed 1,000,000 acres. Ten years ago the acreage was 2,604,122 acres; latest figures are well over 3,000,000 acres.

The area of land devoted to wheat has doubled in 30 years. In 1875 it was 898,820 acres; at last harvest 1,681,982.

The wheatfields of South Australia have yielded magnificently for four seasons in succession. Here is the record — 1903-4, 13,209,465bush.; 1904-5, 12,023,172bush.; 1905-6, 20,143,798bush.; 1906-7, 17,145,796bush.; 1907-8, 20,720,000bush.

South Australia now sends away as wheat and flour the equivalent of 16,000,000bush. of grain in round figures. The value of shipments last season was nearly £2,500,000. Notwithstanding expenditure on artificial manures, wheat-farming was never so profitable as it is to-day.

While record wheat harvests are being taken off the land, cultivation is every year becoming increasingly diversified.

South Australian apples are the finest in the world. Between 300,000 and 400,000 cases are annually produced, and the quantity is being rapidly added to every year.

South Australian apples and pears were awarded a silver-gilt medal at the Franco-British Exhibition in 1908.

The "make" of wine now amounts to about 3,000,000galls. The quantity has been more than doubled in the past 10 years.



Side Show at a Corrobboree, Central Australian Natives.

Flocks and herds are being restored to dimensions existing before years of unfavorable seasons, and care is being exercised not to overstock. Sheep compare thus—1857. 2,075,805 ; 1867, 4,477,445 ; 1877, 6,098,359 ; 1887, 6,000,000 ; 1897, 5,032,541 ; 1907, 6,624,941 ; 1908, 6,829,634.

Dairying in South Australia is an important industry. The factory system was inaugurated in 1885. The figures for 1907 show that 8,873,630lbs. of butter were made, and 1,398,785lbs. of cheese. Exports were 2,202,885lbs. of butter and 154,324lbs. of cheese.

There are in South Australia 98,000 dairy cows. Butter from this State has won competitive honors in London. The dairying industry is worth £500,000 per annum.

In 1908 South Australian salted butter secured first prize at the British Dairy Show against world competitors.

The average natural fertility of the soil is high.

Productiveness depends upon atmospherical conditions as well as natural fertility. In the northern portion of the State the rainfall is insufficient for agriculture, and is used only

for pastoral purposes. In the central portion, which is several times the size of England, the rainfall is good, and agriculturists prosper. In the south-eastern division the rain register is heavier, and more intensive cultivation is possible.

The absence of excessive moisture in the central division limits the labor and expense of the farmer, and favors the production of cereals, fruits, &c., of unsurpassable quality.

Owing to the absence of excessive rain there is no leaching of the soil, and therefore the delicate elements which make up fineness of flavor and high quality are retained in the land and transferred to its products.

South Australian wheat is the best in Australia. For whiteness, dryness, and plumpness it is the best in the world, South Australian wheat and flour have taken prizes in London and Paris against the rest of the globe.

The best South Australian butter is unsurpassable for fineness of flavor.

South Australian apples have topped the London market because of their beautiful flavor.

The soft fruits, such as peaches and apricots, grow to a remarkable degree of perfection.

South Australian grasses are particularly nutritious, and hence cheese, butter, lambs, &c., of the finest quality are producible.

Where conditions are favorable for intense culture the soil responds magnificently to the aids of irrigation and fertilization.

In addition to the absence of excessive rains South Australian farmers have a great advantage over their European competitors in that the addition of nitrogenous manures is unnecessary for cereal-growing. *The soil is self-nitrogenating.* The nitrogen-producing bacteria thrive wonderfully in the warmer and drier conditions of this State.

Phosphatic manures are in general use in the State, and are very profitable. Dressings of 40lbs. or 50lbs. up to 1cwt. per acre of superphosphate are the most popular. Superphosphate is produced from local deposits of phosphatic rock, and costs under £4 per ton.

The combination of cereal-growing and lamb-raising is a popular and profitable practice. The number of sheep which can be kept and lambs raised on an ordinary-sized farm is surprising. As many as 500 ewes can be maintained on a 300-acre farm, 100 acres of which is cropped every year, 100 acres fallowed, and 100 acres pastured if the best methods are adopted. These ewes would produce between 400 and 500 lambs, and the proceeds of wool and lambs would realise for best quality over £400. All the while the sheep would be helping to put the land into the best possible heart for crop-raising.

The Agricultural College farm at Roseworthy carried an average of 1,354 sheep on the 538 acres available for grazing in 1906-7, in addition to from 70 to 80 head of cattle and from 250 to 300 pigs.

Much hope is entertained that with greater knowledge of the best methods to adopt the vast areas of low rainfall country—from 5in. to 12in. per annum—will be utilised for agriculture. One farmer in 1907 obtained 38bush. per acre from 100 acres, with a rainfall of less than 9in.

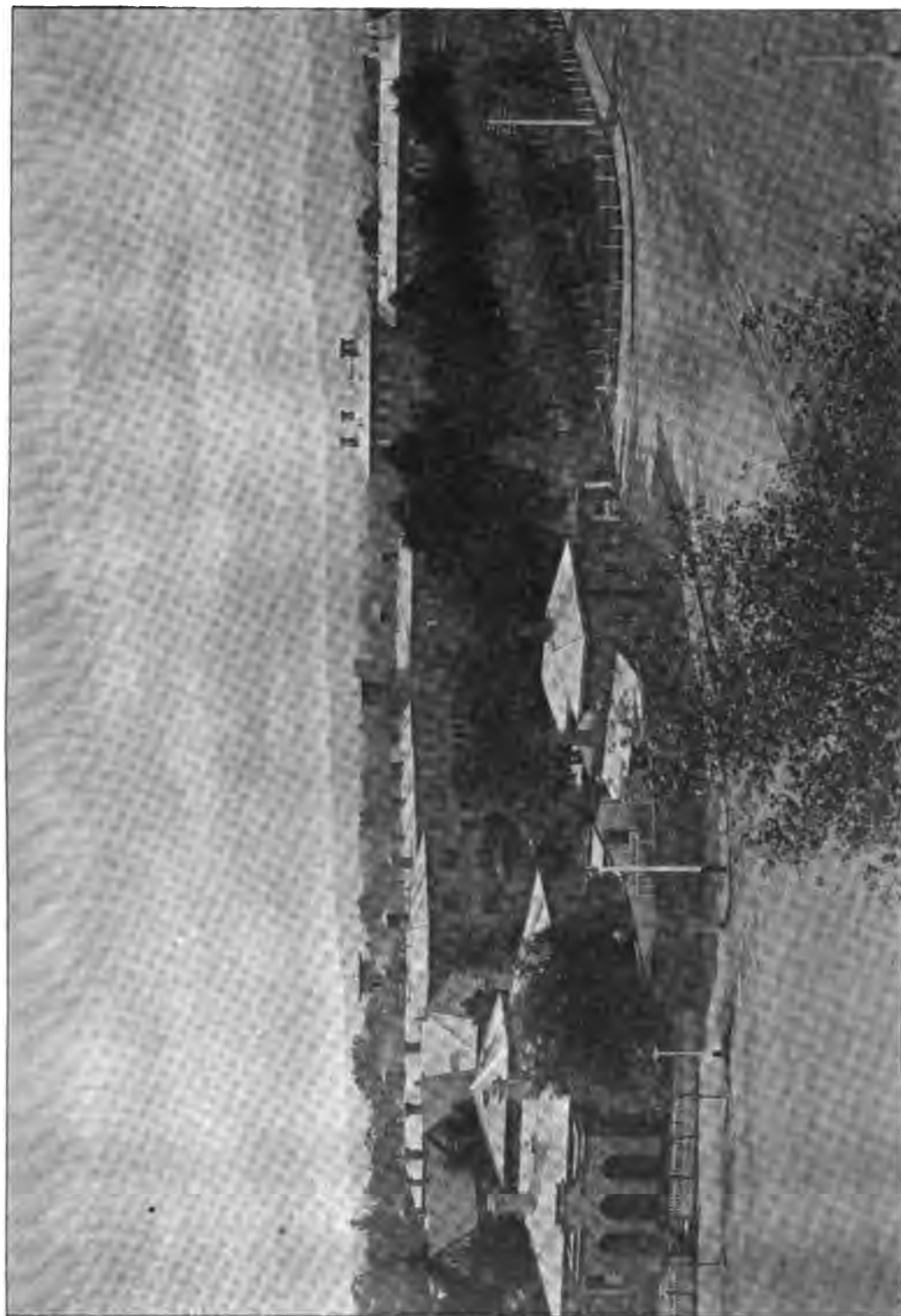
In the south-eastern division of the State, where the rain register reaches higher figures, a suitable rotation of crops is being worked out, and individual instances of abnormally prolific yields are frequent.

Where irrigation is practised yields are enormous, thus testifying to the remarkable fertility of the soil.

A State Department of Agriculture exists for the extension of the rural industries, the discovery of the best methods, and the promotion of efficiency in those who are engaged in agricultural and kindred pursuits.

An excellent Agricultural Bureau system is in existence. Nearly every district has its bureau for the discussion of agricultural problems and practices. A central body organises annual conferences, and acts as an advisory council to the Government.

Messrs. F. B. Guthrie and G. W. Norris, writing on the "Milling Characteristics of Australasian Wheats" in the *Agricultural Gazette* of New South Wales, April, 1907, stated—



THE ADELAIDE HOSPITAL.

[E. Gall. Photo.]

"The South Australian samples undoubtedly attain the highest average of excellence as milling wheats. The types most generally cultivated in South Australia—such as Marshall's No. 3, Gluyas, Carmichael's Eclipse, Petatz Surprise, Dart's Imperial—are all attractive-looking, plump samples of good bushel-weights, yielding a straight-grade flour of first-class baking quality. In strength and gluten contents they are above the New South Wales wheats, and in color they are just as good, and the f.a.q. sample is the best milling f.a.q. sample of any of the States."

The cost of production in the primary industries is the lowest in the world.

Cost of Production. Land is cheap, the soil is easily worked, and local implements are admirably adapted for economical and efficient operation. South Australia is the home of the stripper, the multiple plough, and the harvester, which reaps, winnows, and bags the grain in one operation.

In the central districts the cost of the mechanical operations of the farmer, together with the expenditure for rent, manure, seed, &c., may be put down at £1 5s. per acre, or 1s. per bushel for a crop of 25bush. to the acre. Many crops in these districts exceed this, and in 1907 one field averaged 71bush. per acre. The cost per acre in Argentina is £1 12s. 6d. per acre, and in England, in 1890, it was £4 11s. 7d. per acre, without manure.

A farmer in one of the central districts, whose holding is 344 acres, crops one-half every year. His average receipts from the 172 acres he crops are £518 8s., and his average expenditure £182 1s. 4d., leaving an average return for his labor and capital of £336 6s. 8d. His land is worth from £5 to £7 per acre.

Land may be purchased privately in the central districts for from £4 to £10 per acre, well equipped for farming. In the picked spots of the South-East the price varies from £20 to £80 per acre. In the dry districts of the North the land may be secured for less than 10s. per acre. Crown lands, unimproved, but suitable for farming, away from the centres, ranges from 3s. to £1 per acre, with 30 years in which to pay the principal, or $\frac{1}{4}$ d. or upwards per acre on perpetual lease or lease with right of purchase.

Said Professor Lowrie, formerly Principal of the South Australian Agricultural College, and a shrewd, level-headed Scotsman—"I question whether there is a better investment in land for a small capitalist who is prepared to put his money into it and work it. In this State there is a better return where there is legitimate farming, if you take the full range of it, than in any place of which I have had experience or where I have taken note of farming. Can those people who cry out about the 'poor farmer' mention any other country where they can buy land and win from the first crop the whole of the purchase-money and half the expenses, and with the second crop be standing on carpet? I honestly believe that there is from 10 to 15 per cent. on the money if you like to put it in."

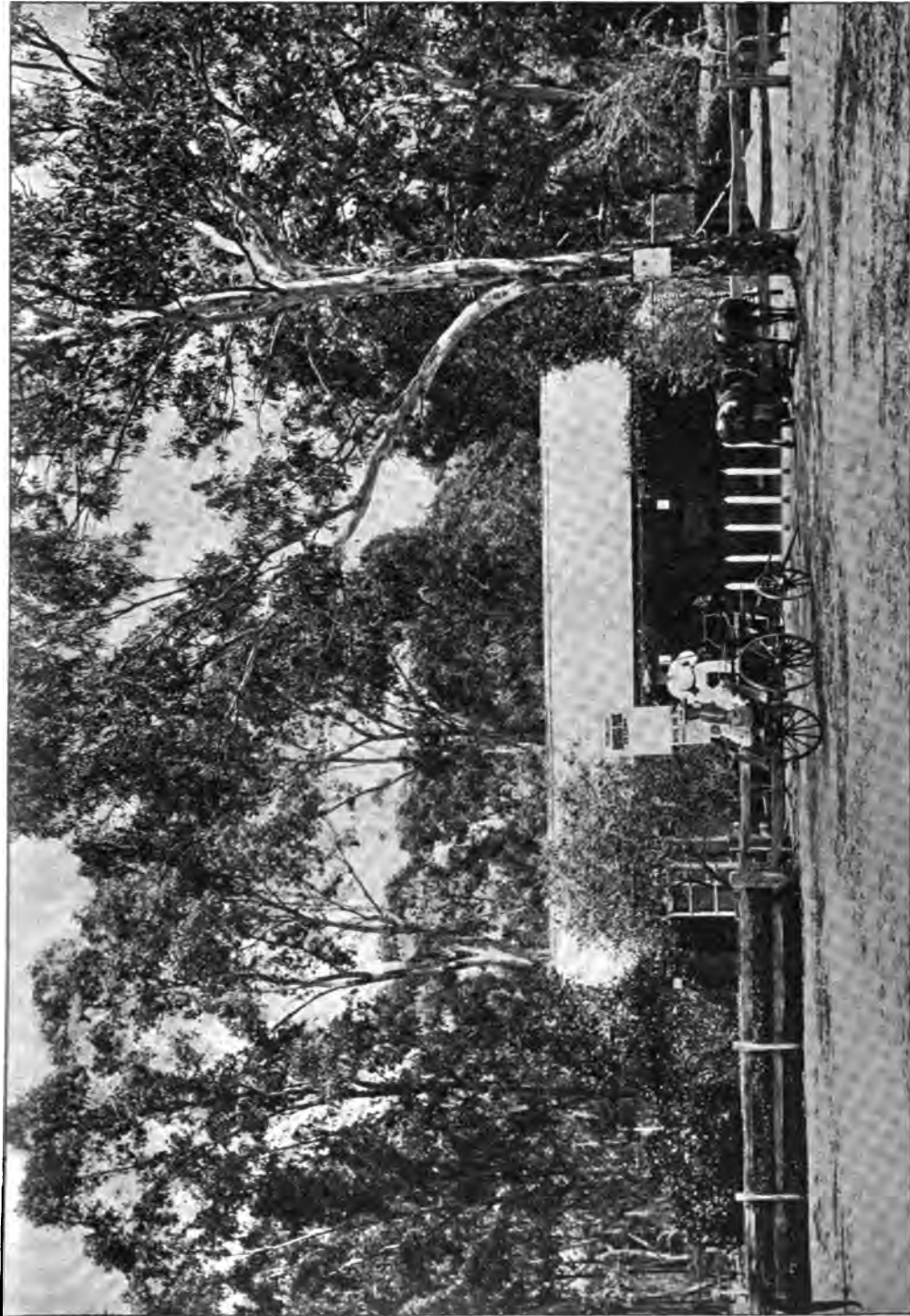
Since the preceding utterance Professor Lowrie has presided over an Agricultural College in New Zealand, and he recently stated that he obtained a greater value of product from £6,000 worth of land in South Australia than from £27,000 worth in New Zealand.

The land laws are on a liberal basis, and there is a genuine desire on the part of the administration to encourage settlement. Pastoral lands can be secured on long leases, and every assistance and encouragement is given by the Government to persons wishing to purchase Crown lands.

Persons wishing to become possessors of freehold can obtain advances on favorable terms from the State Bank.

Up to the end of June, 1907, the Government had purchased 37 large estates, comprising 326,576 acres, at a cost of £842,000. These have been subdivided into blocks suitable for farmers. The purchase-money is paid back to the Government in half-yearly instalments spread over a long period.

During the last 12 months several more estates have been purchased, and these will shortly be surveyed and thrown open for application.



VIEW IN THE NATIONAL PARK THE PEOPLES PLAYGROUND.

[J. Marshall, Photo.

Minor Industries. Poultry-farming on a large scale and on scientific principles is a coming industry. There are 1,634,333 head of poultry in the State. Last year's exports of eggs amounted to £106,873.

Shipments of eggs and frozen poultry have been made to England, and a profitable trade is likely to be opened up in course of time.

It has been officially stated by experts that "no olive oil surpasses in quality, lucidity, and creamy delicateness of most delicious flavor the oil that is produced in South Australia."

Olive oil manufactured in South Australia was sent to the Crystal Palace Exhibition of 1851, and gained "honorable mention" for "its clearness, color, and flavor." Since then South Australian olive oil has taken numerous prizes all over the world. Large quantities are used in the hospitals and also by the British Navy on the Australian Station. The "make" of olive oil last season was 20,000galls.



In the Macdonnell Ranges.—(Note the Aborigines at the Base and Top of Rocks.)

Currant-growing is an established industry in several parts of South Australia. "I know of no more profitable method of utilising good land than in currant-growing," says the Professor of Agriculture in an official report.

The finest apples in Australia are grown in South Australia. South Australian apples fetch the highest prices in the London market. Oranges grown at Renmark (South Australia's Irrigation Colony) are successfully exported to England, where they are much appreciated. During the 1907 season high prices were obtained for South Australian oranges in London.

Horticulture has long since passed beyond the experimental stage. Soil and climate are eminently suited to the production on a large scale of all kinds of fruit.

Hay-growing is a profitable auxiliary to the production of grain. Large quantities of chaffed hay are exported to other States, and South Africa is frequently a big purchaser of compressed fodder.

There are a number of fine natural salt lakes in South Australia. This State led the way in the Commonwealth in giving a commercial value to the crude article.

Large deposits of blue cement rocks were discovered near Adelaide a few years ago, and large quantities of the finest quality cement are now made by a local cement company.

The annual bark yield in South Australia is from 8,000 to 10,000 tons; worth, say, £50,000.

The area under orchards and gardens is 26,578 acres.

Nearly 600 tons of honey is produced annually in this State.

The demand for South Australian dried fruits is in excess of supply.

Currants and raisins of the highest quality are grown in South Australia.

English and Continental experts have written—"No oil that has ever been sent into a market surpasses in quality, lucidity, and cream delicateness of most delicious flavor the oil that is produced on the Adelaide plains."

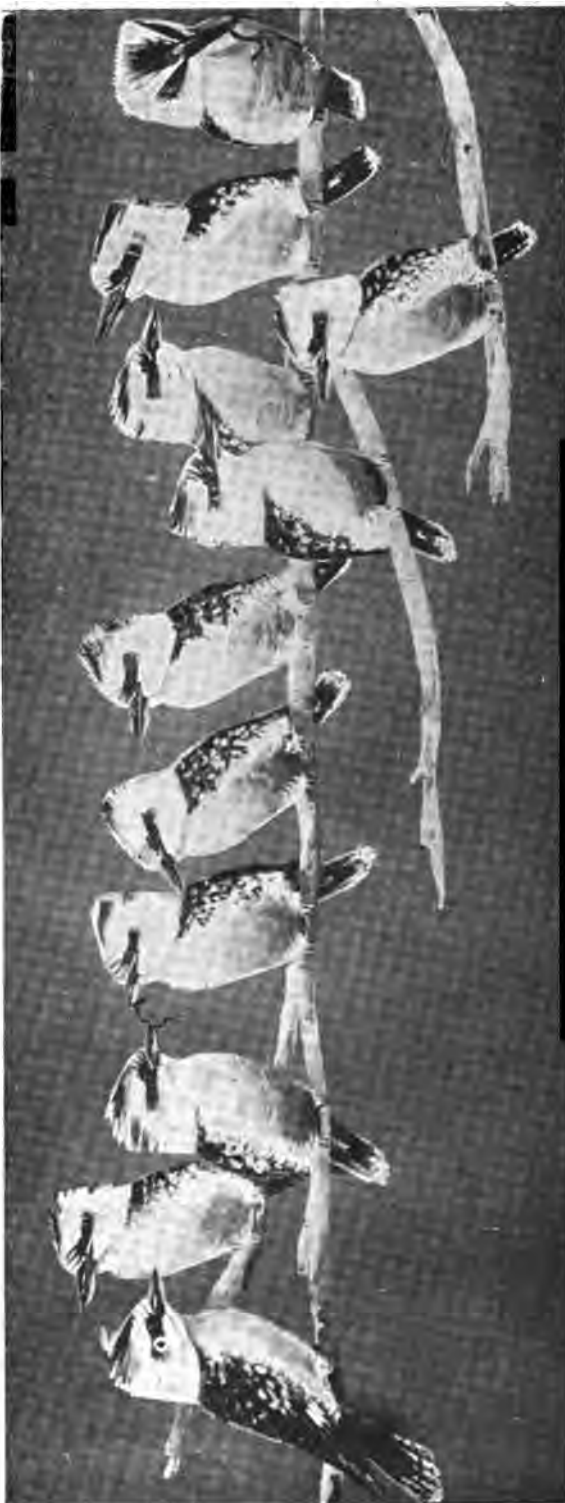
In 1907-8 there were in South Australia 83,153 olive trees, and 16,164 galls. of oil were made.

A big grower of olives states that from 14 acres he had a net return of £200!

The climate and soil of South Australia are so favorable to the production of all kinds of grain, fruit, vegetables that there is practically no limit to what in a comparative sense may be regarded as "minor industries."

"South Australia is among the favored few places to which Nature has granted a monopoly of olive cultivation." Thus wrote Sir Samuel Davenport, the father of the industry in South Australia. Last season 16,164 galls. of oil were made.

Four representative Scotch fishermen visited South Australia in September, 1908, and said the waters of the State were well supplied with many varieties of fish. They propose to settle in South Australia and bring a number of their countrymen to the State.



A "South Australian Eleven."—The Koolaburra (Laughing Jackass).
(From a painting by Miss Mabel Boothby, Adelaide.)

Bee-farming, ostriches, Angora goats, and pig-raising are among the profitable "minor industries of South Australia."

Wattles are extensively cultivated and the wattle-bark industry is steadily expanding "The broad-leaved wattle of South Australia," says the Consulting Botanist of the Forest Department of New South Wales, "is one of the richest tanning barks in the world. South Australia has practically the monopoly of this bark, and it is a grand heritage—the envy of the eastern States."

In South Australia the State helps the producer in a variety of ways. The Government seeks to be philosopher, guide, and friend to the men on the land. Experts are provided for every department of rural life, and "demonstration" farms in various localities act as every-day object lessons to farmers.



Drying Apricots in the Sun at Renmark.

[J. C. Reinars, Photo.]

Manufactures. South Australia's annual production from its workshops is computed at about £3,000,000.

Employment in some of the Australian manufactories is as follows:—Smelting, 2,500 men; chaff mills, 678; soap factories, 526; sawmills, 347; agricultural implements, 246; engineering, 1,000; butter and cheese, 375; sugar refinery, 1,450; wine, 300; printing, 360; chemical works, and fertilisers, 200.

Transportation and Marketing. No Australian State has better facilities for transportation than South Australia. It has 1,814½ miles of railway, owned and managed by the State; 5,000 miles of main roads, constructed and maintained by the State; and scores of jetties, constructed and maintained by the State, along its extensive coastline.

In addition to numerous private agencies for the marketing of produce, there is a Government Produce Depot, which exports lambs, fruit, butter, cheese, poultry, eggs, honey, &c., for producers.

The Government Depot charges the settler with the bare cost of dealing with his consignments, and has been a great boon to him.

A State Commercial Agent resides in London and facilitates the marketing of exports with England and elsewhere. He tenders advice as to packing, quality, &c., and is always on the lookout for new outlets and for information which will make for the production of the best quality and secure the most economical handling and the highest prices.

Educational. Religious freedom is a prime factor of life in South Australia. No State aid of any kind is given to any church. All stand on the same basis and owe their success to voluntary effort.

In South Australia education is free, compulsory, and secular. There are 708 State schools in various parts of the State, and the Education Department employs 1,316 teachers. The average daily attendance of children during 1906 was 40,000. The higher grades of education receive attention at the Adelaide University, the School of Mines, and the State Agricultural College.



A Vegetable Exhibit at an Agricultural Show.—Large Quantities of the Finest Vegetables are Grown in South Australia.

[W. S. Smith, Photo.]

Literary institutes are established in most of the towns in the State. They provide current and classic literature and promote intellectual tastes. These institutes are liberally supported from the public revenue.

Agricultural shows are held annually in all the principal districts. They promote a healthy stimulus in quality of production and serve as opportunities for friendly intercourse between settlers of widely distant residence.

Opportunities for recreation are numerous, and recreation grounds are attached to many towns. In the charming climate games of all kinds flourish, and the youth of the State develop into active and sunny men and women.

The press is admirably represented. The city of Adelaide has two excellently conducted daily papers, which supply the news of the world with as much promptness as do the British dailies. The price is 1d. per copy, and an issue frequently comprises 16 pages. There are also well-illustrated weekly publications and many provincial newspapers.

South Australia presents one of the best opportunities for living a full life. A glorious climate, splendid material resources, excellent aids to the development of the intellectual and moral faculties, and an atmosphere of religious and political freedom. Why live half a life elsewhere?

A Call for Settlers. South Australia has numerous beauty spots and resorts for tourists. Mr. Frank T. Bullen, author and lecturer, wrote—"When you reach the upper slopes of Mount Lofty and are suddenly bidden to turn and look down upon the city, which lies basking in the golden sunlight, edged by the glittering sea, you recognise that you are in the presence of one of the fairest scenes that earth can afford."

"Of all the cities I have ever seen Adelaide comes easily first in the perfect beauty of its situation and arrangement."—Mr. Frank T. Bullen.

South Australia offers splendid prospects to settlers with some capital wishing to enter into agricultural pursuits. Land suitable for farming, sheep-farming, poultry-farming, fruit-growing, or viticulture can be taken up or be purchased on reasonable terms.

Loans on mortgage can be obtained on favorable terms for the development of settlers' holdings.

Produce of all kinds is handled, prepared, and packed for export by the Government Export Department and shipped to European markets for disposal at low charges. Fruit, dairy, poultry, and farming experts have been appointed by the Government to assist producers with advice as to the best methods of cultivation, breeding, &c., and as to the most up-to-date ways of marketing produce.

The Government has recently established a State Tourist Bureau, and this department is prepared to give every assistance to tourists and settlers.

Intending settlers and tourists from England can see maps and obtain information from the office of the Agent-General for South Australia, at Threadneedle House, 28, Bishopsgate Street Within, London, E.C.

Port Pirie. Port Pirie, the chief outpost of South Australia, has a population of 10,000 inhabitants, and occupies the position of fourth shipping port in the Commonwealth. Its yearly imports, according to the latest figures, show, in round numbers, 554,037 tons, the estimated value of same being £849,627. The exports for a like period amount to 516,840 tons, the value of these being £4,174,470; the total imports and exports, therefore, standing at 1,070,877 tons, valued at £5,024,097 sterling. The railway traffic in and out is close on 1,000,000 tons yearly. The bulk of the inward traffic consists of ore from the Broken Hill mines, of which about 250,000 tons is treated annually by the Broken Hill Proprietary Company here.

The net registered tonnage of vessels inward and outward—extra colonial, inter-State, coastal, and flux barges—exceeds 1,000,000 tons per annum.



"Droving."

[W. S. Smith. Photo.]

Now this is the law of the Overland, that all in the West obey:

A man must cover with travelling sheep a six-mile stage a day;

But this is the law which the drovers make, right easily understood:

They travel their stage where the grass is bad, but they camp where the grass is good.—PATTERSON.



**EDUCATIONAL BUILDINGS ON NORTH TERRACE,
Showing University, Art Gallery, Museum, Public Library, and Institute.**

(Ernest Galt, Photo.)

CHAPTER XXXI.

EDUCATION.



WHETHER or not the system of education in South Australia realises Huxley's ideal—"a great educational ladder with one end in the gutter and the other in the University"—experts agree that it represents a gradation in regular steps towards "practical education" not excelled in any part of the world. A remarkable evolution in educational methods has been witnessed in this State since the passing of the first legislation on the subject in 1847; and the movement has been in the direction of a scientific development of mind and body.

The State System.

During the pioneer days there were no public schools, and little attention was devoted to the training of the young. Towards the end of the forties a capitation grant was paid out of the State funds to the few private schools then in existence, but the plan did not work well. "The pilgrim fathers" had no toleration for anything that looked like "State aid to religion." Five years later the Government assumed direct control of primary education, and early in 1852 a Central Board of Education was created—(1) To establish schools, or recognise such schools as were already in existence, in which good secular instruction, based on Christian principles, but free from sectarian difference of belief or opinion, should be imparted. (2) To grant licences to teachers, and to pay them out of State revenues salaries ranging from £40 to £100 per annum in augmentation of the fees paid by the parents of the children. (3) To appoint inspectors, who should visit the schools and make reports on the character of the instruction given to the Central Board; and (4) to recommend the Colonial Government to give grants in aid of buildings erected by local subscriptions, up to an amount not exceeding £200 per school. The next important step was taken in 1875, when the management of the public schools was given to a Council of Education under the presidency of a paid officer. A wise choice was made in selecting for this responsible post Mr. John Anderson Hartley, B.A., B.Sc. (Lond.), at that time headmaster of Prince Alfred College. Mr. Hartley is regarded as having been the father of the educational system of South Australia. For over 20 years he controlled the destinies of the department, exercising a noble influence on the child-life of the State.

The Council of Education was superseded by direct management with Mr. Hartley as Inspector-General in January, 1878, and on his death the control was vested in a Board of Inspectors, consisting of Messrs. L. W. Stanton (Chairman), Thomas Burgan, and C. L. Whitham. In July, 1902, the Board was abolished, and an Inspector-General again appointed (Mr. L. W. Stanton). In 1906 Mr. Alfred Williams was appointed Director of Education, Mr. Stanton becoming secretary to the Minister.

The Primary System.

Prior to 1891 the State system of primary education was known as a secular and compulsory system, but not free. The Act of 1875 was, however, further amended in 1891, and as from January, 1892, this Act provided that "no fee shall be payable by any parent to the Minister, or to any teacher of a public school established under the provisions of the Education Act, 1875. for the education of any child in any such school." This Act further provided that in the case of children between the age of 9 and 13 years the compulsory distance should be increased from two to three miles. To satisfy the compulsory requirements of the Act each child in the State between the ages of 7 and 13 years, residing within the compulsory radius, must attend an efficient school for at least 35 days each quarter. Legislation was passed in 1905 by which the compulsory attendance was increased to eight half-days out of every 10 for children living in or within one mile of any corporate town.

The curriculum is of an elastic character to permit of some display of individuality on the part of teachers. The regulations fix the course of instruction; but while the main line of subjects is defined in order to secure uniformity of work in all grades of primary schools, variation is permitted under the approval of the district inspectors. Head teachers also exercise discretion within the limits of the general organisation, but greater freedom is allowed in the teaching of such subjects as elementary science, horticulture, agriculture, and other various kinds of manual work. The following is a summary of curriculum:—1. English—Clear and distinct articulation, correct speech, reading, writing, spelling, oral and written composition, grammar, poetry. 2. Mathematics—Arithmetic, mensuration, algebra, geometry. 3. Civics and Morals—History, conduct, citizenship. 4. Handwork—Drawing, brushwork, “Kindergarten” exercises, modelling in clay, cardboard, &c., needlework. 5. Music and Physical Culture—Singing, breathing, physical exercise, drill. 6. Nature Knowledge—Observation lessons, nature study (whenever possible allied with gardening), geography, elementary science (in Classes V. and VI.).



Typical Public School (Norwood).—Visitors' Day.

[W. S. Smith, Photo.]

Physical Culture. Considerable attention is devoted to physical culture. Drill and physical exercises are part of the curriculum. Swimming is taught by experts. To the accompaniment of their own drum and fife bands the State school children can “march past” or engage in military manoeuvring with the accuracy and precision of well-trained soldiers. Sewing, drawing, and vocal music are taught in all State schools. In the larger centres instruction in cookery and household management is given to the girls, and the boys are trained in the various branches of manual work.

The State primary schools are of two kinds—public schools, under certificated teachers, and provisional schools, taught by uncertificated teachers. The latter, however, are required to undergo a special examination, and to serve in an efficient school for a specified time. The public schools are divided into nine classes, and the salaries of head male teachers range from

£110 in a Class IX. school, with an average attendance of 20 to 40, to £420 per annum in a Class I. school, with an average attendance of 600 or over. The salaries of head female teachers range from £92 to £156. A lady cannot be appointed as head teacher to a school in any class above VII. The salaries of male assistants begin at £100 and rise by annual increments to £150. Chief assistants receive further yearly increments to a maximum of £200. Female assistants' salaries, beginning at £84, rise to £124, with a maximum of £156 for chief assistants.

The course of study and the standard of examination is exactly the same in both public and provisional schools. A strict supervision is kept upon the daily working of the schools by means of a staff of inspectors. Districts are allotted, and the inspectors pay periodical visits, subjecting the classes to a critical examination, and allotting merit marks which affect the reputation of both teachers and scholars.



A Public School Kindergarten Class.—(The Observation School, Currie Street.

Training Teachers.

For the benefit of those desirous of devoting their lives to teaching an excellent Training College was established in 1876. All students were non-resident. In 1900 a new scheme of training was introduced. The Council of the University of Adelaide, having received a large bequest under the will of the late Sir Thomas Elder, made a generous offer to the Minister of Education, by which those in training for teachers would be allowed to have a two, and some a three, years' course of study for the B.A. or B.Sc. degree free of cost. It was, therefore, arranged that candidates, after showing a capability to teach (as monitors), should be admitted to the Pupil Teachers' School, where they study for two years to pass the Junior and Senior Public Examinations (the latter being the matriculation standard of the University). After this they spent two years teaching in the larger public schools, and then enter the University Training College for another two, and possibly three years, as stated above. During the term of training students receive a maintenance allowance of from £30 to £80, according to circumstances.

To assist in the training of teachers, an Observation School has been established in Adelaide. While at the High School the young teachers pay weekly visits to this school—for which a special staff is provided—and observe methods of teaching, besides receiving instruction in the art of teaching from the head master. In connection with this school special steps are being taken to develop a system of practical training for provisional teachers. A small school has been erected in the grounds which will serve as a model provisional school, and before being sent to an appointment provisional teachers will be required to spend some time here under the supervision of an experienced and expert teacher. It is intended to establish one such model provisional school in connection with each district high school.

State Secondary Education.

A High School has been established in Adelaide. The old Grote Street school has been converted into a well-furnished, well-equipped school, with well-lit, airy classrooms, chemical, physical, and nature-study laboratories, and roomy and convenient lecture-rooms. This school, with the old Training College and Advanced School, will accommodate 500 pupils. There



High School, Grote Street, Adelaide.

are at present 400 in attendance. It is intended to have one such school, on a smaller scale, in each inspector's district. Classes for more advanced work than that done in the public schools have been established in connection with the schools at a number of rural centres. These classes provide children living in country districts with opportunities for higher education which are keenly appreciated. These primary schools with higher classes for advanced pupils resemble the "higher grade" schools of Scotland. The subjects taught in these classes are—English, mathematics, history, geography, elementary science (experimental), geometry, and Latin.

Number of State Schools.

There were 722 State schools in South Australia, with 57,270 on the roll in 1906, with 1,426 teachers, including 170 monitors, and the salary list amounted to £132,959 for the year 1906. The cost of education for the year ending December, 1906 was—Primary, £150,542; secondary, £2,170; or a total of £152,712. Exclusive of expenditure on buildings, improve-

ments, repairs, &c., the amount spent on buildings, improvements, land, &c., from 1876 to 1906 amounted to £525,660. The cost per child educated, and also per child in average attendance since 1888, are shown thus—

				Cost per Child Educated.	Cost per Child in Average Attendance.					Cost per Child Educated.	Cost per Child in Average Attendance.
				£ s. d.	£ s. d.					£ s. d.	£ s. d.
1888	..	..	..	2 10 3	4 0 3	1898	..	..	..	2 4 6½	3 10 0½
1889	..	..	..	2 12 0½	4 2 2	1899	..	..	..	2 4 9½	3 6 1½
1890	..	..	..	2 11 10	4 4 3	1900	..	..	..	2 6 6½	3 7 4½
1891	..	..	..	2 10 8½	4 0 2	1901	..	..	..	2 7 4½	3 8 5
*1892	..	..	..	2 7 1	3 11 1	1902	..	..	..	2 7 5½	3 9 11
1893	..	..	..	2 5 3	3 14 10	1903	..	..	..	2 7 0	3 8 1½
1894	..	..	..	2 3 0½	3 5 2½	1904	..	..	..	2 7 11½	3 9 1½
1895	..	..	..	2 3 7½	3 5 5	1905	..	..	..	2 10 6½	3 11 4½
1896	..	..	..	2 3 10	3 4 11	1906	..	..	..	2 12 6½	3 14 4½
1897	..	..	..	2 4 4½	3 4 10½	1907	..	..	..	2 15 0½	3 19 3½

* Free education introduced.

The Adelaide University.

The higher grades of education are well represented in a splendidly managed University, School of Mines, agricultural and private colleges. The University of Adelaide was established by Act of Parliament in 1874. In 1881 Royal Letters Patent were issued by Her Majesty Queen Victoria declaring that the degrees granted by it should be recognised as academic distinctions and rewards of merit, and be entitled to rank, precedence, and consideration throughout the British Empire as if granted by any University in the United Kingdom. The University owes its origin to the munificence and public spirit of the late Sir Walter Watson Hughes and Sir Thomas Elder, G.C.M.G., each of whom gave £20,000. Parliament provided for an annual grant from the public revenues of a sum equal to 5 per cent. on the capital funds then or afterwards to be possessed by the University, the grant, however, not to exceed the sum of £10,000 in any one year. Under the authority of the same Act there was an endowment in land of 50,000 acres and a grant of five acres in the City of Adelaide as a site for the University buildings. The University grants degrees in Arts, Science, Law, Medicine, and Music, and Diplomas in Music and Commerce, and in conjunction with the School of Mines and Industries in Mining Engineering, Metallurgy, Mechanical Engineering, and Electrical Engineering—(see Calendar for 1908, p. 107).

It was the first University in Australia to provide for the granting of degrees to women, as authorised by Act of Parliament in 1880. At first the professorships founded in the University were four in number, their subjects being the following:—(1) Classics and Comparative Philology and Literature; (2) English Language and Literature, Mental and Moral Philosophy; (3) Mathematics; and (4) Natural Science. The first and second were established in accordance with the terms of Sir Walter Watson Hughes' donations, and bear his name; the third and fourth carry in the same way the name of Sir Thomas Elder. The academical work of the University was commenced in March, 1876, the number of matriculated students having been eight, and of non-graduating students attending lectures 52. The foundation-stone of the University buildings was laid by His Excellency Major-General Sir W. F. D. Jervois, K.C.M.G., on July 30th, 1879, and the buildings were opened by him in April, 1882. Their total cost, including that of subsequent additions, was about £38,000. In 1883 Sir Thomas Elder, G.C.M.G., made a second gift to the University amounting to £10,000, for the foundation of a School of Medicine. The University Council thereupon established a Chair of Anatomy and a Lectureship in Physiology, and made further provision for a medical course. In 1884 the Hon. J. H. Angus, M.L.C., gave £6,000 for the endowment of a Chair of Chemistry, and in the following year the first Angus Professor of Chemistry was appointed. The Chair of Music was established in 1884 and a Professor of Music appointed. This chair had no special endowment, but through the efforts of His Excellency Sir W. C. F. Robinson, K.C.M.G., it was supported for the first five years by voluntary subscriptions from the public amounting to over £530 per annum, of which

sum Sir Thomas Elder contributed £300 yearly. In 1890 the Council established a Professorship of Law in place of the Lectureship in Law which had existed since 1883. In 1878 the Hon. J. H. Angas gave £4,000 to provide for scholarships to encourage the training of scientific men, and especially civil engineers, with a view to their settlement in South Australia. Since 1892 Mr. Robert Barr Smith has presented to the University £8,000 for the purposes of the library. The library now, in consequence of the large additions rendered possible by these gifts, contains about 20,000 volumes. Sir Thomas Elder bequeathed to the University the sum of £65,000, his total gifts to the institution amounting from first to last to £100,000. By the terms of his will the bequest was apportioned in the following manner, namely—£20,000 to the School of Medicine and £20,000 to the School of Music, while the residue was left available for the general purposes of the University. An Elder Conservatorium of Music was accordingly established in 1898, in which instruction is given in all branches of musical education. The foundation-stone of the Conservatorium building was laid by Governor Sir Thomas Fowell Buxton on September 26th, 1898. The Conservatorium, which contains a large public hall

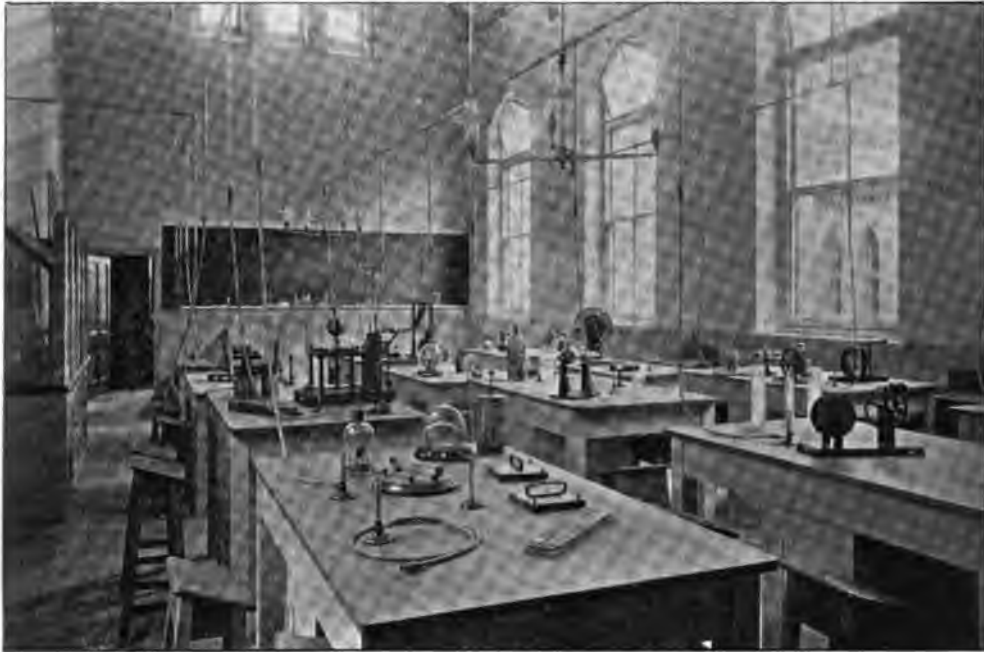


Nature Study Room, High School, Adelaide.

[Gazard, Photo.]

and an admirable suite of classrooms for instruction in music, was completed in February, and formally declared open by His Excellency the Governor, Lord Tennyson, on the 26th September, 1900. In consequence of the large increase in the number of students and the absolute necessity for increased accommodation for the Engineering and Science Schools, a large suite of rooms has been built. His Royal Highness the Duke of Cornwall and York laid the foundation stone on July 11th, 1901, and gave his consent that the structure should be called the Prince of Wales Building. In 1898 the Council was enabled, by means of Sir Thomas Elder's bequest, to make arrangements for a post-graduate course in Mining Engineering and Metallurgy, and for the granting of a diploma in these subjects, but since 1903 the University and School of Mines have combined in regard to the applied science courses. The University is governed by a Council, which usually consists of 20 members, elected by the Senate, but which consists of 21 members whenever the Chancellor at the time of his election to that office is not a member of the Council. The Senate consists of all graduates of the degree of Master or Doctor, in any of the several faculties, and of all other graduates of three years' standing,

besides graduates of other Universities who have been admitted *ad eundem gradum* by the Council. The number of graduates admitted by examination since the establishment of the University is 445. The number of undergraduates in the year 1907 was 388, and non-graduating students 266, exclusive of those studying at the Elder Conservatorium, of whom in 1907 there were 336. The teaching staff of the University comprises 10 Professors and 25 Lecturers, and that of the Elder Conservatorium 10 teachers. During recent years in the interests of education some of the benefits provided by the University have been extended to country districts. In many country towns permanent centres have been formed, committees appointed, and facilities provided for holding the various public examination in general education and in music and for courses of Extension Lectures. The Adelaide University has important relations with Western Australia. As that State has no University full advantage of the facilities offered by Adelaide has been taken. The Technical School at Perth is affiliated; some of the courses of lectures are recognised by the University, thus enabling a number of students in the western State to proceed with degree courses. In addition, the University holds all its public examina-



Physics Laboratory, High School, Adelaide.

{Gazard, Photo.

tions in Western Australia, for which many hundreds of candidates enter each year. This extension of University privileges to remote parts of the State and to a sister State represents one of the most significant evolutions in higher education, and emphasises the fact that the University is for the people, and shows that the Council has adopted a progressive and broad-minded policy.

The scope of University teaching has been widely extended during the past few years. The extension of the curricula and the steady growth of students have compelled the Council to provide extra accommodation. A public demand for commercial education has been met by providing first an advanced course and subsequently a Diploma course. The Elementary Commercial Examination was held for the first time in December, 1902. A Senior Commercial Examination has since been provided. The success of the experiment induced the Council to establish a Board of Commercial Studies. Mr. Joseph Fisher, a pioneer colonist, provided an endowment of £1,000 to provide for a public lecture (subsequently published) on a subject relating to commerce. A popular form of University teaching are the Extension Lectures given by the professorial staff. These are largely attended during the winter months. An

important development of the University movement in South Australia is the training of school teachers. The Chancellor of the University, in a recent public utterance, claimed that there was no other country in the world in which the University provided for candidates in elementary school teachership a free, a compulsory, and a liberal education. The University aims, said its Chancellor on a recent occasion, at giving a "complete academical and professional and special training to all the candidates of the teaching profession in Adelaide free of charge, and without adding a sixpence to the burdens of the taxpayers. There was no event in the history of education in South Australia of more far-reaching importance" than the arrangement which had been concluded for training school teachers. "It secured to every teacher in South Australia, to every one of that important Public Service, the social status to which they were entitled. It secured to them a professional training of a high class, and some of the benefits of the endowments of the University of Adelaide. He know of no other University in the world that attempted anything of the kind." The Chancellor went on to say that the teachers get "the advantage of training at the University for two years, which in the aggregate amount of fees



Nature Study Class (in Connection with State Education Department) at Work.—Students from High School in the Quarry at Tapley's Hill.

would total about £1,400; that was to say that the University presented the students with £1,400. They had the assistance of 34 professors and lecturers and four demonstrators. They had the use of a library of 20,000 volumes, and laboratories which had cost £10,000. They were the pioneers in breaking down the narrowness and exclusiveness of class which recognised the republic of letters alone, and demanded that the teacher was as much a member of the learned professions as the doctor and the lawyer. They had on a small scale the University pupil continuation school in those who were working in the evenings for the completion of the course and to obtain the authorisation of the University degree. The number of professors, lecturers, and teachers has increased from five in 1882 to 45 in 1907; undergraduates from 12 to 388; non-graduating students from 99 to 266, and the number of Conservatorium students from nothing to 336; or a total advance in the number of students from 111 in 1882 to 990 in 1907. The number of candidates for public examinations in the same period has risen from 141 to 2,976. A large number of valuable scholarships and exhibitions are made available every year. The University of Adelaide is affiliated to the Universities of Oxford and Cambridge.

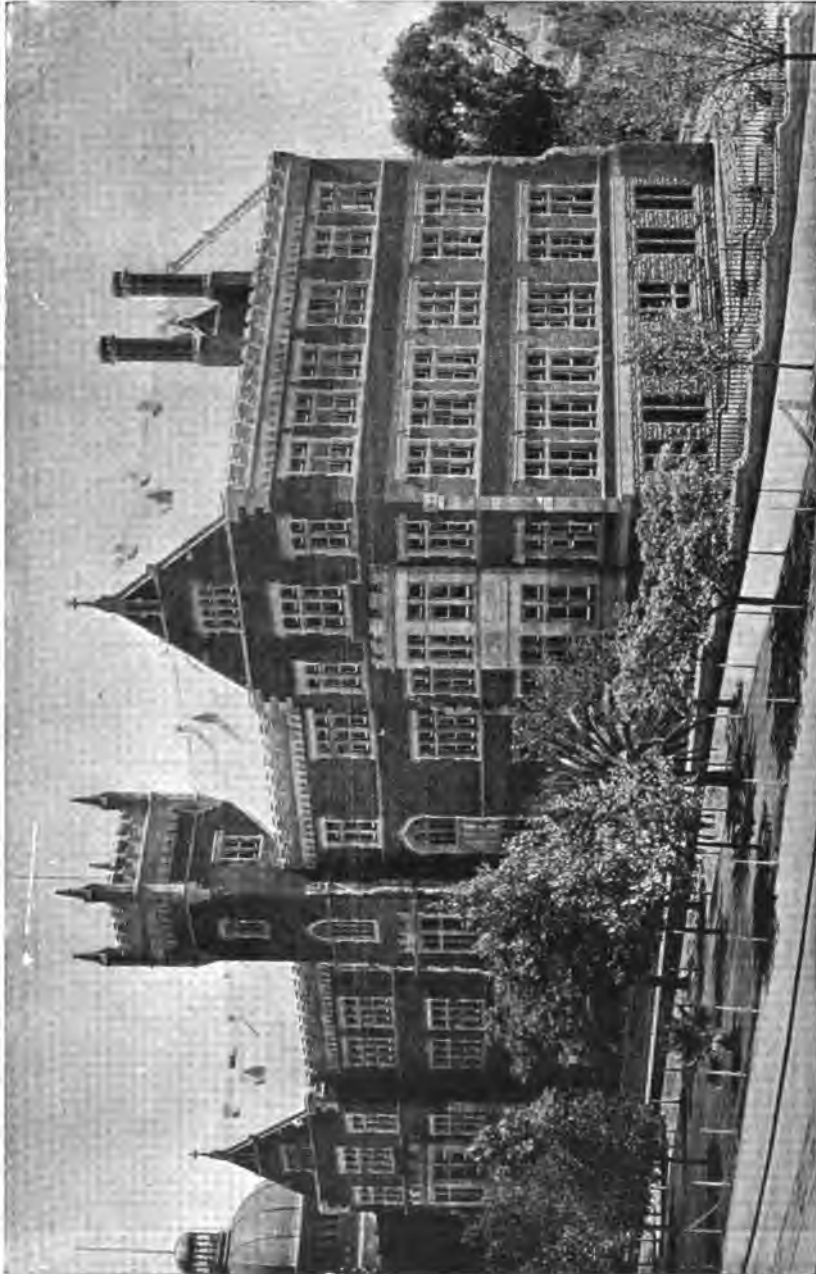
Information can be obtained from Mr. C. R. Hodge, Registrar.

The School of Mines.

March 14th, 1889.

South Australia is greatly blessed in its School of Mines and Industries—an institution which in everything but name is a high-grade technical college. It is the largest and most efficient training establishment of its kind in Australia. The actual work of the school began on

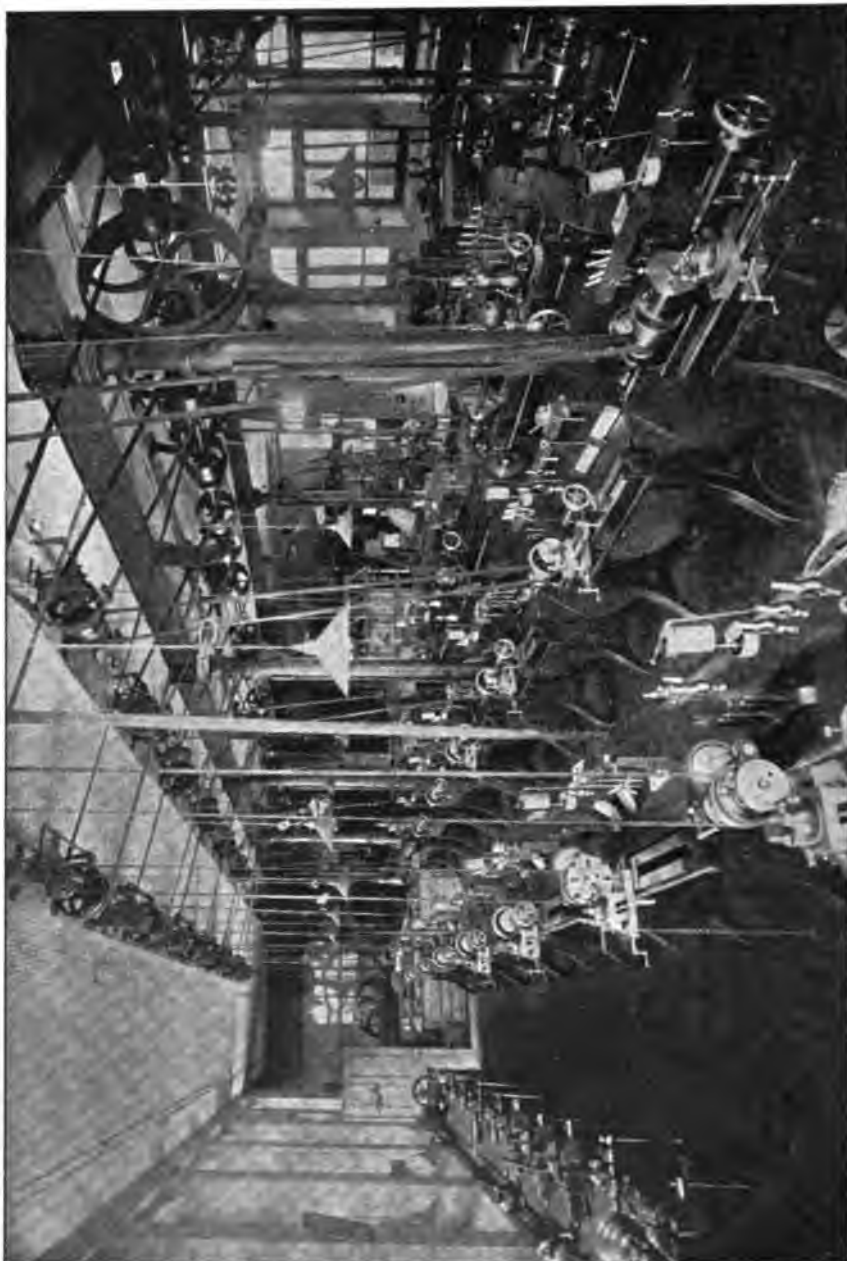
On that day 26 students were enrolled, and the curriculum contained 11



The South Australian School of Mines and Industries and Technological Museum, Adelaide.

subjects. Success was immediate, and at the time of the formal opening of the institution by the Governor (Lord Kintore) three months later the most sanguine expectations of the officials had been more than realised. The necessity for increased accommodation was felt for many

years. The Government had decided to place on the Estimates the sum of £10,000 for a new building, but the princely generosity of the Hon. G. Brookman, M.L.C., who gave £15,000, prompted them to at once proceed with the erection of premises more commensurate with requirements. The cost of the new building, apart from that of the site, was over £37,000.



Mechanical Workshop. South Australian School of Mines and Industries.

The Council was soon able to congratulate itself on the possession of a building in every way second to none in the Australian States. On the occasion of the opening ceremony of this magnificent structure the following letter, addressed to the President (Sir Langdon Bonython) by Lord Tennyson (the Governor-General), was read:—"Commonwealth of

Australia. Governor-General, Marble Hill, Adelaide, February 23rd, 1903. Dear Sir Langdon—I congratulate the Government and you on the opening of the fine building where is to be housed your excellent School of Mines, of which you have been for so many years the leading spirit. I am glad to learn that you are working hand in hand with the University of Adelaide, and I have much pleasure in testifying again to the very valuable service your school performs for Australia. It is certainly one of the best of its kind that I know, and many of the men trained here are to be found in all parts of the world holding good positions. Yet Australia is, generally speaking, a long way behind in the race of technical handicrafts and industries. For instance, when I have visited agricultural shows throughout this continent everywhere I have found the stump-jumpers and strippers of which the South Australians are justly proud; but, be it observed, most of the other implements and agricultural machinery are made in Canada and America. In order to keep pace with the times Australia will have to bestir herself, to welcome fresh ideas and inventions, to encourage the introduction of new and improved methods, to place no artificial restrictions—to the detriment of production and trade—on the output of commodities and manufactures; and, above all, she must multiply her technical schools and better her technical education. It is, more than anything else, the training (in the workshop) of those directing scientific industries, as well as of the workers themselves, which makes a great industrial community. By adopting such means, with the aid of practical enthusiasts like your Lieutenant-Governor, Mr. Brookman, and yourself, Australia will, I feel sure, be able eventually to develop her wonderful resources, and to attain to her rightful position among the industrial and commercial peoples.—Yours truly (Signed), TENNYSON.” The reproach that Australia is a laggard among nations in the matter of “technical handicraft and industries” is rapidly being removed by such institutions as the South Australian School of Mines. In December, 1907, an important addition to the equipment of the School was made, when new Metallurgical and Chemical Laboratories were made available for students. The new building—named the Bonython Building, after the President of the School, who contributed £1,500 towards its cost, which totalled £5,400—now comprises the finest laboratories in the Commonwealth. In another direction, early in the present year, the facilities for study were improved by the addition of the Angas Wool Laboratory. Wool-classing is an important subject taught at the School. The President (Sir Langdon Bonython), who has devoted many years of splendid service to the institution, said on the occasion of the opening of the laboratory that he was told, and had no reason at all to doubt the statement, that the operations of these wool classes directly and indirectly had added to the wealth of South Australia in hard cash a sum far larger than the total expenditure from its origin to the present time on the Adelaide School of Mines and Industries. This was in the highest degree satisfactory, and was a wonderful tribute to the value of technical education. It is not so difficult to understand the position when the statement made some years ago is remembered that “the wool of 250,000 sheep had passed through the hands of School of Mines students this year, and wool experts estimate that by reason of better classing the wool has yielded to the producer fully £6,000 more than would otherwise have been received.” The chief executive officer is the Registrar, Mr. Laybourne Smith, from whom all information relative to the School is obtainable.

Agricultural College. Technical education on the agricultural side has received considerable attention. In addition to a well-equipped Agricultural College, situated at Roseworthy, 30 miles north of Adelaide, there are Agricultural Bureaux scattered throughout the State, whilst secondary agricultural instruction is obtainable at many of the public schools. Upon the establishment of the institution its objects were stated to be—(1) To train young men for the practice of agriculture, horticulture, and viticulture; (2) to conduct experiments with a view to the advancement of the rural industries in South Australia. Professor Custance, the first principal, was in charge from 1881 until 1886. He was succeeded by Professor Lowrie, M.A., B.Sc., who arrived in February, 1888, and retained the position until September, 1901—13½ years. Professor J. D. Towar, M.S., succeeded him in May, 1902, and held the position of Principal to June, 1904. In August, 1904, Professor A. J. Perkins, at the time Secretary for Agriculture and Departmental Professor of Viticulture, was appointed Principal, which position he still occupies. He has been connected previously with the institution since 1892. Six scholarships are offered annually,



MAIN BUILDING ERECTED IN 1883



A PORTION OF THE DAIRY HERD



HAYSTACKS IN THE BUILDING

ROSEWORTHY
AGRICULTURAL
COLLEGE
SOUTH
AUSTRALIA

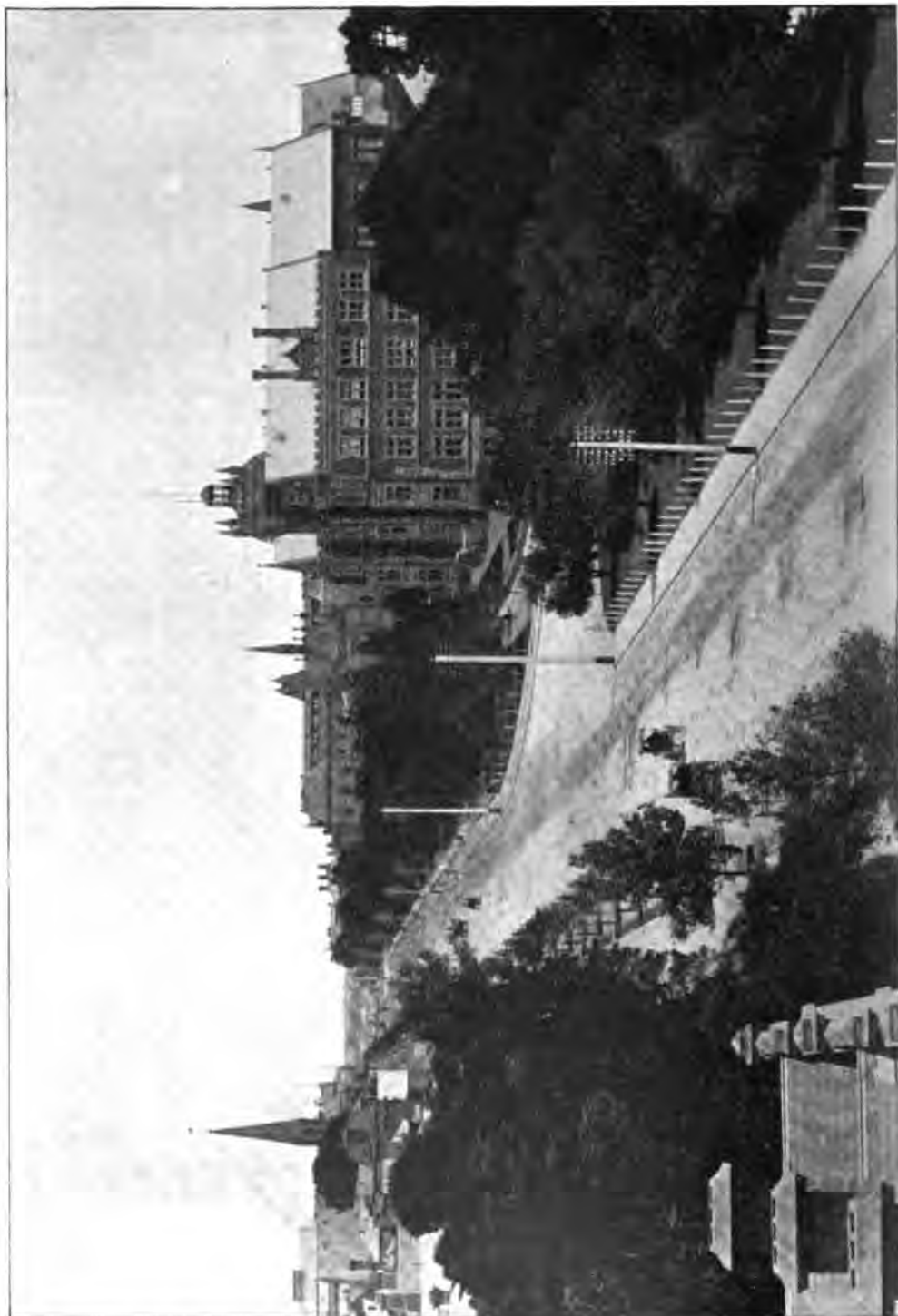
the State being divided into so many districts for the purpose. For several years the course of instruction at the college covered two years; but soon after his arrival Professor Lowrie pointed out that this term was too short, and urged that it should be extended to three years. The recommendation was adopted as from the beginning of 1893. The curriculum is as follows:—First year—Mathematics, anatomy, book-keeping, agriculture, chemistry, meteorology, heat, electricity, and botany. Second year—Mathematics, physiology, chemistry, agriculture, viticulture, fruit culture, mechanics, surveying, and wool-classing. Third year—Chemistry, agriculture, veterinary science, viticulture, oenology, surveying, mechanics, physiology, and wool-classing. Students who desire to attend only two years are required to pass an entrance examination equivalent to the sessional examination at the end of the first year. The fees were originally fixed at £50 per annum, but in 1888 they were reduced to £30. Students are admitted for a six months' course in dairying or poultry.

Educating the Farmer.

It is impossible to estimate in sterling value the beneficial influence exercised by this college on the agricultural industry during the past 20 years. It has led the way in revolutionising farming methods in South Australia, and to Professor Lowrie more than to any other man is due the rapid expansion of the system of drilling in seed with artificial manures. His staff and enterprising farmers ably seconded his efforts, but Professor Lowrie headed the revolutionary band. The work he began is being carried on with skill and enthusiasm by his successors. Special attention is devoted at the Agriculture College to "diversified farming," and valuable experiments are conducted in live-stock breeding—more particularly the production of lambs suitable for export. The scope of experiment work in agriculture has, within recent years, been extended considerably. It embraces everything likely to prove of advantage to Lower North farming. New buildings have been erected for accommodation of students and teaching purposes, and a well-equipped dairy has been established in connection with the college.

Public Library, Art Gallery, and Museum.

The Public Library, Museum, and Art Gallery of South Australia was established in 1884. Under the name of the South Australian Institute it was incorporated in 1856. It comprises a free public reference library, a natural history museum, an art gallery, an art museum, and a school of design, painting, and technical arts. Affiliated with it are the Royal Society of South Australia, the South Australian Society of Arts, the Astronomical Society of South Australia, the Geographical Society of Australasia (South Australian Branch), and 166 country institutes. It is governed by a board of 18 members, of whom eight are nominated by the Government, five are elected by the country institutes, two by the University of Adelaide, and one each by the Royal Society of South Australia, the South Australian Society of Arts, and the Adelaide Circulating Library. At the laying of the foundation stone of the Public Library building, Mr. Rowland Rees referred to the University of Adelaide as "an institution which will provide that higher education hitherto unattainable at common or ordinary schools. . . . It remains to supply the middle course of the structure to connect primary with secondary schools by links composed of higher subjects, the secondary education being that acquired after the elementary school days are passed, and composed of teaching bearing on the life-work of the people, if need be, where social necessity arises, cultivation in the highest form which the University provides, as well as in the 'elegancies of literature and art and the pursuit of science for its own sake apart from its utility.' . . . We are met to-day to witness the laying of the first stone of an institution intended to provide those missing links in the great educational chain to which I have alluded." The objects thus outlined have been strenuously pursued by the Board with much success, although very often under adverse circumstances. The Public Library was opened in 1884 with a collection of about 21,500 volumes, which had increased in June, 1908, to 67,933. A travelling library, containing 6,000 volumes, is circulated in boxes among affiliated country institutes. Each box contains 30 volumes, and each institute changes its boxes three times a year. A special library of technical and scientific works is also available for circulation among country institutes. The Museum in 1884 occupied the northern half of the Library building, but in 1895 the present Museum building was handed over to the Board, and even this building, 200ft. x 45ft., is now taxed to



North Terrace, Adelaide, showing School of Mines Buildings and Public Library.

its utmost to accommodate the specimens. Recognising this position, the Government has prepared plans for the eastern wing of the Public Library block, so that relief may be afforded to the Museum and Art Gallery, each of which is now overcrowded. The Australian ethnological collection in the South Australian Museum is claimed to be the finest in the world. The purchase in 1907 of the Reuther ethnological collection for £400 has much enhanced the institution's importance in this connection. The Art Gallery in 1884 was located in a room at the south end of the Public Library, but was afterwards removed to rooms in the Exhibition Building. Here for some years the collection was housed in a building of a very inflammable character. The Board felt that this was a serious menace, and it was therefore greatly relieved when it became known that Sir Thomas Elder, K.C.M.G., had left a legacy of £25,000 for the purchase of pictures. The Government at once admitted the necessity of erecting a suitable Art Gallery building. This was opened to the public on April 7th, 1900. The Elder bequest has made it possible for the Board to add some fine examples of the leading modern artists to the collection, and a large portion of the bequest still remains unexpended. The Art School, under the control of the Governors of the Library, has grown to large proportions. The students in training under the Education Department, as well as those in the South Australian School of Mines and Industries, receive their art education in this school. Art examinations are held under the authority of the Board in Adelaide and various country towns, and also in Perth, Western Australia. Since 1904 drawing has been a subject for the University Primary, Junior, and Senior Public Examinations, and the Board's certificate is accepted by the University authorities as proof of efficiency in art subjects. A South Australian Mechanical Draughtsman's Certificate is issued jointly by the Board and the Council of the South Australian School of Mines and Industries, and another by the Board and the Council of the Moonta School of Mines. Over 806 students were taught in the Art School in 1907, and since 1886 28,076 examination papers have been worked by candidates for the Board's certificates, of which 16,599 have been issued. The prospects of the institution have been greatly improved by a magnificent legacy from the late Dr. Morgan Thomas. This estate was wound up in June, 1908, and the Board, which is the residuary legatee, has received nearly £65,000. The Public Library and its associated departments is doing excellent educational work. The Royal Society of South Australia, the South Australian Society of Arts, the South Australian Branch of the Royal Geographical Society of Australasia, the Zoological Society (with its magnificent collection of animals), the Botanical Gardens, are all rendering great public service in the same direction. South Australia is also well served by an excellent metropolitan and country press.

The Secretary and Principal Librarian is Mr. J. R. G. Adams, from whom all required information can be obtained.



A Typical Pastoral Homestead in the Saltbush Country, Bimbowrie, in the North-Eastern Portion of the State.

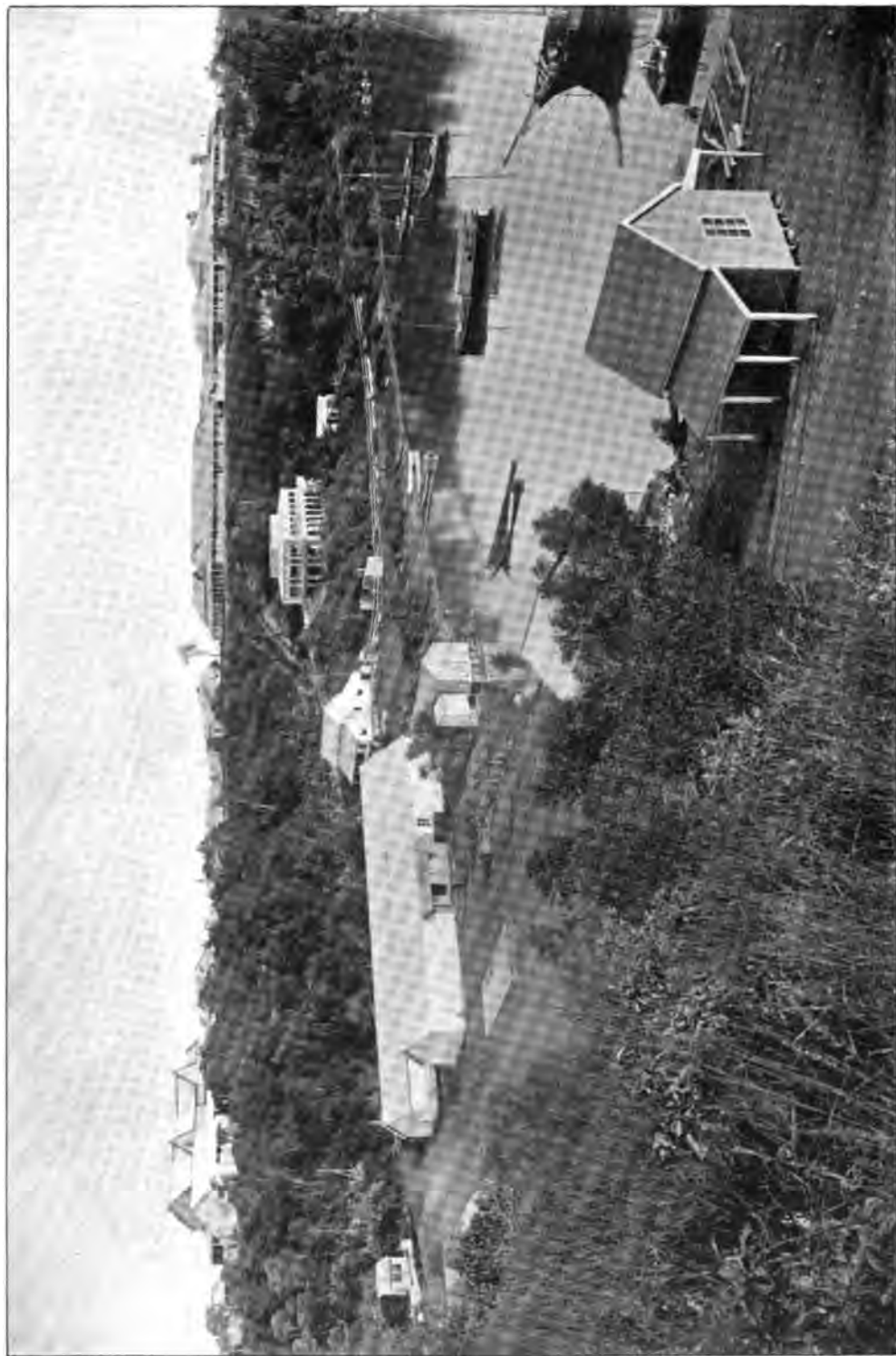
THE NORTHERN TERRITORY.



HERE are two Australias. One lies within the tropics and the other is in the temperate zone. Nobody disputes that fact because nobody who cares to look at the map can doubt it. Northern Australia is in the same latitude as Mozambique, Samoa, Abyssinia, and Senegambia. It has been established—also beyond doubt—that the country is capable of producing on a commercial basis such products as sugarcane, rice, maize, linseed, varieties of oil plants, tea, coffee, indiarubber, tobacco, cotton, millet, and cocoanuts. Yet, with a soil capable of raising such choice products, a rainfall that can be measured in feet, and no lack of sunshine, the Northern Territory continues to be a nightmare to Australian statesmen and a geographical enigma to the rest of the world. After 45 years of unsuccessful occupation South Australia has agreed to transfer the great tract of country to the Government of the Commonwealth, on certain conditions providing for financial readjustment and railway connection.

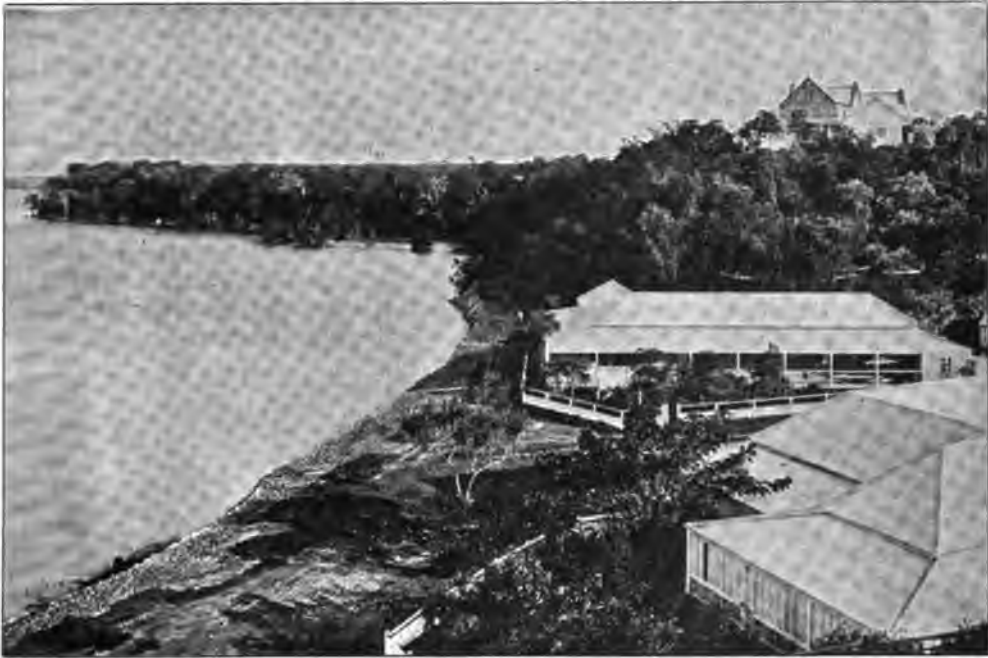
Area and Climate.

The Northern Territory is that range of country which commences 100 miles north of Oodnadatta, the northern terminus of the railway system of South Australia proper, and extends to Port Darwin, on the north coast of Australia. It comprises about one-fifth of the whole of Australia, and extends from latitude 26° S. to latitude 11° N., and lies between longitude 129° and 138°. It thus covers about 15° of latitude and 9° of longitude, or, roughly, 560 miles wide by 900 miles long, and contains an area of about 523,620 square miles, or 335,116,800 acres. With the exception of about 2½° the country is within the tropics or torrid zone. The area of the United Kingdom is in round numbers 77,000,000 acres, and of France 130,000,000 acres, so that the Territory is about two and a half times the size of France, and four and a half times the size of Great Britain. The area sold is 473,230 acres, leaving unalienated 334,643,482 acres. The Northern Territory has a frontage of 1,200 miles to the Indian Ocean, intersected by numerous rivers, many of which, such as the Roper, the Adelaide, the Daly, the Victoria, &c., are navigable for from 20 to 100 miles from the sea. The number and volume, therefore, of these great rivers may afford some indication of the fertility of the country through which they flow. Along the extensive northern seaboard there are many valuable harbors, of which Port Darwin is equal, or superior, to any other in Australia. Situated as it is in a commanding geographical position with regard to India and the East, at no distant time it must become one of the greatest trading emporiums of the Southern Hemisphere. Port Darwin, the principal harbor for shipping in the Northern Territory, is situated in latitude (of Fort Hill) 12° 28' 30" S., and longitude 130° 52' E. The harbor is fine and spacious, comprising many square miles of water, varying in depth from 4fms. to 15fms. It is high-water at "full and change," 5 hours 25 minutes. Springs rise from 16ft. to 24ft., and neaps from 2ft. to 12ft. The tides are irregular—the ebb stream commencing some 40 minutes before high water. The year has two climatic divisions, consisting of the wet season (from November to April) and the dry period (from May to October). The different changes of these seasons are so uniform and regular that they may be predicted almost to a day. Signs of the approach of the wet season appear immediately after the sun has crossed the equator during the spring equinox (in September), when the strong east-south-easterly monsoon—which has been blowing continually throughout the dry season—ceases, and is succeeded by calms and light, variable winds; the weather becomes intensely hot, and small thunder-clouds gather over the land,



(CH. XXXII.)

VIEW OF PORT DARWIN NORTHERN TERRITORY FROM FORT HILL



View of Port Darwin Harbor, North of Fort Hill.



The Township of Stuart (Alice Springs), Macdonnell Ranges, Central Australia.

[F. J. Gillen, Photo.]

increasing in size and density day by day until they burst into terrific thunder-storms, accompanied by hurricane squalls of wind and rain. These squalls, at first, take place every four or five days, gradually increasing in number until the end of November, when they occur almost daily. They come up in a dense black bank, and travel so very rapidly that they are generally out of sight on the western horizon within 40 minutes.

These simple statements of facts—a tropical country four and a half times the size of Great Britain, with a total population of 3,600 persons—are sufficient of themselves to indicate that here in this part of the continent of Australia there is room for development. As a matter of fact the country is very little improved since the Portuguese visited it in 1500, and the Dutch a hundred years later, or since Torres passed through the straits that bear his name in 1606. Cook sailed along the coast in the next century, and Flinders in 1801.

Idle Lands Awaiting Hands.



View on the Flora River, Northern Territory.

[P. Foelsche, Photo.]

Portuguese, Dutchmen, and Englishmen, and in later days Australians, have all been unanimous in their praise of the country's natural beauties, the brilliancy of the tropic flowers, the rapid fecundation of tropic fruits, the grandeur of the jungle, and the luxuriance of growth everywhere to be seen. The late Duke of Manchester, after an inspection lasting over several weeks in the Northern Territory, said—"I have seen other parts of Australia, and I must say before coming to Port Darwin I had certainly thought Queensland the finest part of Australia, but I now consider, as far as I can judge by that portion of the Northern Territory which I have seen, that the Territory is superior to Queensland, inasmuch as the vegetation seems richer, the grass thicker and of a more permanent character, and the country much better watered."

Population. The population of the Northern Territory on December 31st, 1907, was estimated at 3,597—made up of 1,302 Europeans and 2,295 Chinese. On only three occasions in 27 years has the European population exceeded the present number.

How South Australia Annexed the Northern Territory.

Sir Gordon Bremer took possession of Raffles Bay on behalf of the British Government, and for a time a military settlement was formed at Melville Island. In 1827 a military depot was established, first at Raffles Bay and then at Port Essington. Leichhardt, the explorer, visited the place in 1845, just before its desertion, and he was followed by Gregory and Stuart. It was the successful journey of the latter from south to north and the additional knowledge supplied by his party of the resources of the country that induced South Australia to become foster-mother to that portion of tropical Australia. Not only did John McDouall Stuart practically "discover" the Northern Territory, but his advocacy led to its annexation by South Australia. Prior to the expeditions of Leichhardt and Gregory the great north-central part of Australia lying north of 26th parallel of south latitude and between the 129th and 138th meridians of east longitude was technically attached to New South Wales. The boundaries of Queensland, South Australia, and Western Australia, even to the disposal of "no man's



View on the McKinley River, Northern Territory.

land," had been agreed upon, but no mention had been made of the territory in between. One of the first proposals made was that it should be proclaimed as a new Crown colony, and subsequently that it should be divided between Queensland and South Australia. When Stuart crossed the continent and planted the Union Jack on the shores of the Arafura Sea, and returned through the heart of Australia to Adelaide, the South Australian Government of the day applied for the land in question. This request was acceded to by the British authorities, and in 1863 letters patent were granted incorporating the Northern Territory with South Australia. Since that time it has been managed from Adelaide, with a Government Resident located at Port Darwin.

A Land of Promise.

Of the great resources of the country under review there never could be any dispute. "Facilities to obtain suitable land; facilities to obtain suitable cheap labor; capital to take advantage of the first two conditions; intelligent management to use and not to squander the capital." "Given these four conditions," says Dr. Holtze, for many years Curator of the Botanic Gardens

at Port Darwin, and now occupying a similar position in Adelaide, "and the Territory will surely become a prosperous field for plantation enterprise." My own journeyings have taken me through the heart of the continent and out in the north-east towards the Queensland border and the Gulf of Carpentaria, and I can confirm many of the statements made concerning the quality of land and the supply of water and good grasses. As in other parts of the world, soil and climate and natural conditions over such a vast area vary. There are all sorts of country and several kinds of climate. Port Darwin in the north has an average annual rainfall of over 60in.; Charlotte Waters, the southern point of the Northern Territory, has about 6in. The traveller between these two points and west and east finds well-grassed downs, rich well-watered plains, heavily timbered, and in every way well suited for stock-raising. In a paper read before the Geographical Society, Queensland, in 1901 Mr. J. P. Thomson, Hon. F.R.G.S., said—"One of the first to publicly express an opinion in favor of the existence of artesian water in Central Australia was the late J. E. Tenison Woods, who was a most intelligent observer, had travelled a good deal in Central Australia, and from an enlightened study



Lover's Walk, Port Darwin.

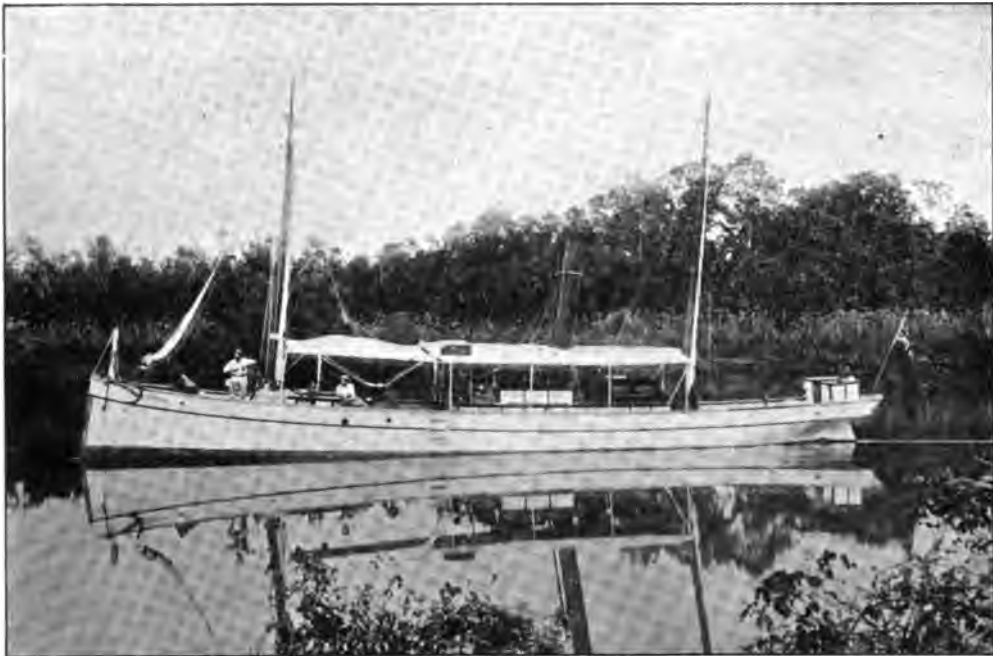
of the rock structure and certain surface indications there he was led to believe that an underground supply of water existed in that portion of the country. . . . For richness of soil and dryness of climate the great inland plains and tablelands of Australia are nowhere else surpassed. An adequate water supply is all that is needed to render them fertile, and this may now be obtained from the effective artesian wells to which I have alluded, and from others where the underground storage reservoirs of the far interior have been tapped."

Finest Country in Australia.

Mr. Charles Winnecke, F.R.G.S., F.R.A.S., explorer and surveyor, wrote—"My experience of the Northern Territory extends over 35 years. I have been astounded at the frequent mention of desert country. My experience is that some of the finest pastoral country in the world is found in Central Australia. Water, principally artesian, is more abundant than supposed. Gold is scattered all through this vast area, one quartz range showing gold

for fully 36 miles. The Orabarra Reef, in the Jervois and Tarlton Ranges, has never been visited by any white man but myself. Professor Tate stated that the best indications of diamonds exist to the west of Charlotte Waters. Coal of good quality is found in the Macdonnell and more northern areas. It speaks for itself that more than a fourth of the Territory is settled with stations, mines, &c. I have no hesitation in declaring that it will be the finest and most remunerative country in Australia. The extent of auriferous country is simply unknown, and a railway would increase all these resources a hundredfold. My past remarks on the fertility of the Northern Territory should be a guarantee that I am not in error."

A Bright Outlook. Mr. L. A. Wells, who recently returned to Adelaide from the Northern Territory, where he had been engaged for two years completing the trigonometrical survey and fixing the boundaries of pastoral leases, has given an interesting account of his trip—"I had ample opportunities for noting the character of the country, having traversed on foot about 3,000 miles whilst conducting the



Steamer "Victoria" on Adelaide River, Northern Territory, with Lord Kintore and Party on Board, 1881.

trigonometrical survey. This kind of work necessitates travelling twice over the area embraced. The Northern Territory has an enormous area of land suitable for grazing and cultivation purposes, and in the vicinity of Victoria River, Sturt's Creek, and the Ord River I am of the opinion that sheep-farming over a large extent of country capable of carrying 2,000,000 sheep, could be profitably carried on if means of transit were facilitated. A large tract is at present waterless, but water can be obtained by well-sinking, and a railway from Broome to a junction with the proposed overland line at, say, Newcastle Waters would open up an enormous extent of country suitable for wool-growing. If the proposed line is constructed from the south through the Barclay tablelands to Port Darwin, another extensive area will be thrown open to sheep-raising. Without a railway transit becomes too costly, and it does not pay to provide water by artificial means for cattle-raising where the markets are far distant. The Victoria and Ord Rivers country is ideal grazing land, and I think these localities would hold their own

with any others in the world at beef-producing. The natural advantages, where all waters are provided by nature, splendid grasses, and an assured rainfall over rich soil make cattle-raising easy, and up to the present time it has rarely, if ever, been found necessary to shift stock for feed or water. Ord River, chiefly in Western Australia, has approximately 100,000 head of cattle, and Wave Hill and Victoria River Downs about 70,000 head each. About 17,000 head of calves were branded at each of the latter runs this past season; but, owing to want of horse-flesh, Ord River were unable to complete their muster. However, the previous season 18,000 head were branded. In a detailed description of the country authorised by the Minister I have previously spoken of the beautiful soil on the basaltic plains, grasses, carrying capacity, timber, etc. The Northern Territory will, in my opinion, be a great producing country when opened up and required by the rising generation. At the present period there are large tracts of land equally as good in Queensland, where markets for produce are within easier reach. I firmly



Baobab Tree on the Victoria River, Marked by Gregory's Exploring Party, 1824.

believe that when the Territory is developed it will be done by white men, and I think no white race more suitable to settle there than Australians, more particularly those from the northern portions of our States."

Stocking the Interior.

At the present time only a relatively small portion of the Northern Territory is stocked with cattle, leaving an enormous area of splendid pastoral country unoccupied. This is by no means confined to the more tropical lands on the fine rivers flowing into the northern seas, or even the vast tablelands further in the interior, but embraces much of the broad expanse of the Territory extending right to the 26th parallel—country with a less rainfall, but in many respects better adapted to horned cattle, and undoubtedly for horses, and even more certainly for sheep. Over this country, where surface waters do not exist, there is strong evidence that abundant supplies can be obtained at shallow depths by sinking wells and artesian bores. It is a remarkable and significant fact that on passing the 26th parallel of latitude the climate

becomes more temperate in these respects. The rainfall increases, the fierce north wind, that plagues so much of Australia, loses its force, and the nights become cooler. The pastoral industry is expanding steadily in the Northern Territory, and it is estimated that between 300,000 and 400,000 cattle are at present depastured on the various runs.

Pastoral Pursuits. The Government Resident (Mr. Justice Herbert), in his last official report to the Government of South Australia, said that the pastoral land transactions and the resulting revenue for 1907 were as follows:—

	Square Miles.
Area held under lease	135,822½
Area held under permit	32,306
Area declared stocked	111,182
Leases surrendered or forfeited	2,947
Permits surrendered or forfeited	1,464
Permits applied for	6,471
	£
Rents received	7,532



Typical Anthill, Northern Territory.

About 36,000 cattle, valued at £180,000, were exported during 1907. The Government Resident looks for a steady increase in the export of cattle to the extent of justifying the erection of meat works. As an outlet for surplus cattle from cattle stations—and as a necessary adjunct to the scheme for the introduction of settlers to be engaged in mixed farming—the establishment of meat works is expected to take practical shape in the near future. If the carrying capacity of that portion alone of the Northern Territory that is permanently watered were reduced to figures, the result would be almost more than surprising. But if we consider the immense area of partially-watered country as thoroughly developed by means of dams, tanks, wells, and artesian bores, the magnitude to which the pastoral industry may attain is even more strongly forced upon the attention. There are also large tracts of excellent pastoral land as yet without surface water, land such as in other States (particularly New South

Wales and Queensland), through the energy and enterprise of the lessees, has, by the judicious expenditure of capital, been formed into the finest stations in Australia. The practical outcome of stocking of but a small portion of the vast area of the Crown lands of the Northern Territory would mean not only the establishment of meat preserving, canning, and freezing works (when the Transcontinental Railway is built), but also an extensive live stock export trade, not only to the neighboring colonies, but also from Port Darwin to Singapore and other Eastern States. An approximate estimate of the carrying capacity of the country to the north of Barrow Creek—some 200,000 square miles, at 10 head of cattle per mile—gives a total of 2,000,000 head. This is a low estimate, as much of the rich pasture land on the rivers flowing from the tableland to the coast will support and fatten many more, probably double the number. The health of the live stock is excellent, and little or no trouble has been experienced.

The tablelands of the Northern Territory are eminently suitable for horse-breeding, and more attention is being devoted to this industry.



Pineapple Field, Northern Territory.

Prospects of Agricultural Development.

The Government Resident at Port Darwin writes—"After another year's experience and further consideration, with the added advantage of my recent visit to Papua, I am confirmed in the opinion which I expressed in the last annual report—that mixed farming on reasonably large holdings is the industry which should occupy the attention and energies of settlers, assisted and unassisted, who may be introduced into this country. Upon quite recently looking up old records I found an account indicating that one of the reasons for the past rapid settlement in the Argentine Republic was the enactment of liberal land laws, to tempt immigrants into the country and settle them in the agricultural districts. The terms upon which land was there offered to settlers were quoted by the late Hon. J. Langdon Parsons in one of his annual reports—'Each head of a family is entitled to 250 acres free, and as much more as he desires to purchase to a limit of 1,500 acres at about 75 cents per acre, or the settler may acquire 1,500 acres free after five years by planting 200 acres to grain and 24 acres to timber. Free transportation from Buenos Ayres to place of

location is granted to all settlers and their families, exemption from taxation for 10 years; and colonisation societies are organised which issue bonds guaranteed by the Government, the proceeds of which are loaned to the settlers in sums not greater than 1,000 dollars for five years at 6 per cent., upon the cultivation of a certain number of improvements. The result of these beneficent laws is conspicuous. In 1886 nearly 900,000 acres of wild lands were ploughed and planted.' Although the above was written 20 years ago, it is the history of a country at a time when in need (as we now are) of population, and which took effective measures to obtain it. The plan suggested in my last annual report for inducement of unassisted immigration approaches nearly that adopted 20 years ago in the Argentine with immediate success, though my suggestion erred in being in some degree less enticing. I made no reference to any scheme for the financial assistance of the unassisted immigrant, but I have since suggested that a system of financial aid to settlers might well be adopted as a corollary to a systematic immigration and land settlement scheme—such system to be based upon that obtaining in New Zealand: no advances to be made until at least 12 months after settlement, and until a certain amount of improvements have been effected."



Bermuda Arrowroot Crop in the Northern Territory.

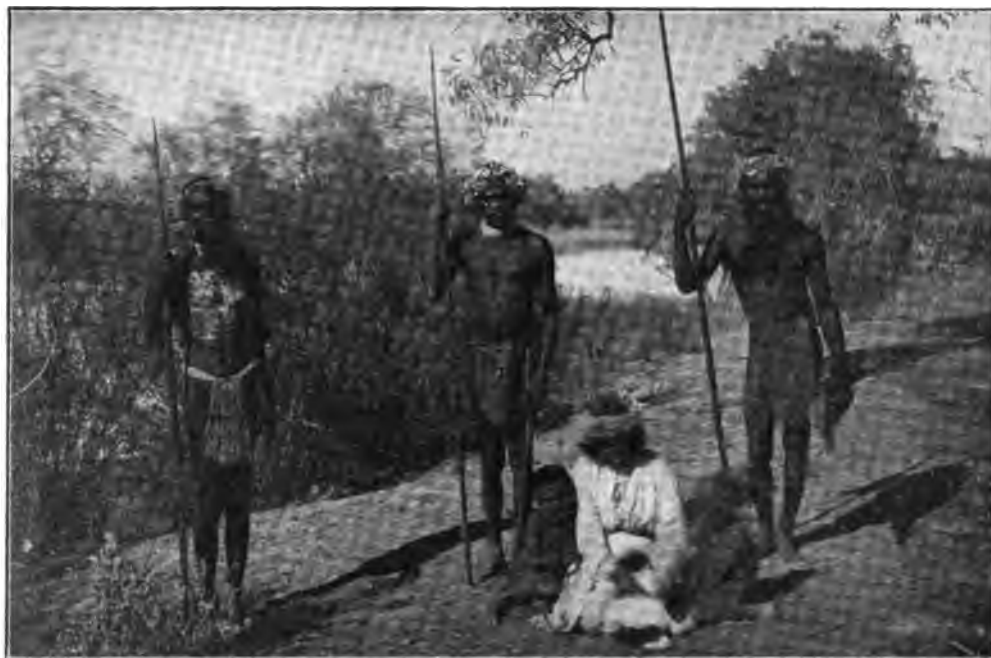
Tropical Plants. There is no doubt that the Northern Territory is singularly noted for the growth of cotton. Although not indigenous, it is now found growing wild through the jungles, and there is no place in the world more adapted for its successful cultivation. Dr. Holtze, when Director of the Botanic Gardens at Port Darwin, sent some of the produce to the Manchester Exhibition, where it was most favorably reported on. The millowners of Lancashire, with the view of emancipating themselves from the rings that control the American supply, are now reported to be searching for some part of the British dominions where they can successfully promote the growth of cotton. They might search in vain for a better place than the Northern Territory. Provision would undoubtedly have to be made in the near future for the labor required. Two kinds—Sea Island and Egyptian cotton—were cultivated in 1906 and they did well, the latter

yielding a heavy crop. In a paper read before the Geographical Society in Adelaide on July 4th, 1901, by Mr. Maurice Holtze, F.L.S., F.R.G.S. (Lond.), who for many years was Director of the Botanic Gardens, Palmerston, Port Darwin, he states there is quite enough suitable land in the northern extremity of the Territory for very considerable cultivation, quite enough to make the country prosperous. The agricultural land is situated near the seacoast and on the banks of the rivers flowing to the sea. Plantations should therefore be kept within a belt of, say, 80 miles wide round the coast, which would give us an area of about 80,000 square miles, or upwards of 51,000,000 acres. A small part of the Northern Territory indeed; but yet even granted that less than a quarter of this area is suitable for agriculture, it is sufficiently large to employ several hundred thousand people in tropical agriculture. This assertion may seem greatly exaggerated till it is remembered that Java, within less than five days' steam from Port Darwin, carries on something like 80,000 square miles a population of considerably over



Wine Palm, Northern Territory.

30,000,000. At the end of 1906 an area of 55 acres was under sisal hemp plant in the Botanic Gardens and Experimental Nursery, planted by prison labor. The growth has been satisfactory to the curator, who hopes that in two years' time machinery will be required for the production of fibre. The Curator of the Botanic Gardens at Port Darwin (Mr. N. Holtze), in his report to the Government Resident, said—"Whether the fibre can be produced at a profit with European labor is a moot point, but I feel very sanguine that with proper management it can. If this can be proved by our experiment, then the problem of the profitable utilisation of a very large area of our Crown lands will have been solved. That the industry is no mean one will, I think, be realised when it is known that America last year imported 200,000 tons of the raw sisal fibre, valued at eight and a quarter millions of pounds sterling. Further, it is estimated that Australia for binder twine alone can consume 10,000 tons of sisal fibre yearly. The rice crop last season was a failure, owing to the want of sufficient rain. This is the first



Northern Territory Natives.

[P. Foelsche, Photo.]



War Dance, Central Australian Natives.

P. Foelsche, Photo.

failure recorded here, and the rainfall returns show that such another season has not been experienced since the records were commenced—35 years ago. This season I have five kinds under trial, and so far they look well." Rubber trees also grow well in this part of Northern Australia.

The Mining Industry. Of the mineral wealth of the Northern Territory the Rev. T. E. Tenison Woods, F.G.S., the famous geologist, after much exploration work and years of experience, said—"I confidently assert that the Northern Territory is exceptionally rich in minerals, only a small portion of which has been made known to the public. I do not believe that the same quantity of mineral, veins of gold, silver, tin, copper, and lead will be found in any equal portion of Australia; in fact, I doubt if many provinces will be found in any country so singularly and exceptionally favored as Arnheim's Land in respect to mineral riches. Of the mines that have already been worked in gold especially, they cannot be said to have gone to any great depth, but nearly all have



Copper Ore at Pine Creek, Ready for Export.

[P. Foelache, Photo.]

shown unusually good ore, and it is unquestionable that not 25 per cent. of the veins visible have been worked at all. Years will not exhaust the discoveries to be made here when the difficulties of labor have been got over, as they will be surely ere long. The peninsula of Arnheim's Land will become one of the great mining centres of Australia." Professor Tate, F.G.S., declared—"The development of the mineral resources of the Northern Territory is but in its infancy, and I believe that rich stanniferous lodes will yet be found. Rich auriferous lodes abound over a large tract of country. It is my honest conviction the gold reefs can be worked profitably and to a considerable depth." Mr. H. Y. L. Brown, F.G.S., Government Geologist in South Australia, in his evidence before the Commission, said—"The present gold mining fields are capable of much further development. They should go in for deep mining." Mr. J. V. Parkes, late Inspector of Mines in the Northern Territory, wrote—"I have no hesitation in saying that the Northern Territory is phenomenally rich in minerals, especially in gold and tin." Mr. H. Y. L. Brown, Government Geologist of South Australia, has also reported favorably on the mineral resources of the country. The total number of men engaged in mining for

the year 1906, in all capacities, was 1,197 (of whom 179 were Europeans and 1,018 Chinese), as against 1,120 in 1905. The output of all minerals, verified by Customs returns, reached for the year a value of £132,146. This result constitutes a record for the Territory. The total production of gold bullion (exclusive of Macdonnell Ranges) was 15,321ozs., valued at £50,001. The gold won at the Arltunga Battery and Cyanide Works, and forwarded thence to Adelaide, was 1,079ozs., valued at £3,971, as against 1,114ozs., value £4,146, for 1905. The total yield of the Northern Territory, therefore, for 1906 was 16,400ozs., value £53,972, as against 15,475ozs., valued at £48,347, for 1905. Only 315 miners were engaged in gold mining last year (out of a total of 1,197), as against 490 in 1905. Of mineral claims 182 were registered. In 1905 the number registered was 185. In 1907, 1,166 men were employed and 200 claims were registered.

The year's production of tin concentrates, as shown by export figures, was 398 tons, valued at £36,907, as against 288 tons, valued at £22,072 for 1905. This result was obtained by 391 men, of whom 77 were Europeans. engaged on the various tinfields.



View on Katherine River, Northern Territory.

Copper exports for 1906 consisted of blister copper, copper bars, scraps, copper contained in matte, and copper ore, and had the aggregate value of £25,062, as against £15,380 in 1905, and is a record output. The substantial increase is mainly due to the operations of the Northern Territories Mining and Smelting Company, Limited, at Yam Creek, which had a most successful but at the same time very short run of three months. The copper output was obtained by 157 men engaged in that class of mining.

Exports of wolfram mineral reached 102 tons, valued at £6,981, as against 63 tons, value £3,379, for 1905. This is the highest point yet attained in wolfram exports.

Pearlshell and Trepanng Fishing. The year's take of pearlshell amounted to 57 tons, valued at £7,833, as against 115 tons, valued at £14,352, for 1905. The number of pearling boats licensed during the year was 45, but the harbormaster states that only 17 were engaged in fishing. The export of trepanng reached 84 tons, of a value of £6,056, as against 62 tons, valued at £2,929, for 1905.

The Trade Record.

The total value of imports for the year was £74,659, showing a decrease as against the preceding year of £12,219. The large decrease is believed by the Sub-Collector to be accounted for by a depression in commercial matters, but at the same time points out that £7,000 of the shortage is due to the prohibition of the importation of opium. The total value of exports for the year was £154,222, exclusive of cattle exports, which equalled another £100,000. The result is a very material excess on the figures of 1905, and is mainly due to exports of minerals. The total revenue actually collected was £17,711 7s. 4d., as against £20,617 0s. 5d. for 1905, or a decrease of £2,905 13s. 1d. The principal heading responsible for the decrease in revenue is narcotics, but this was expected, and it was estimated in last year's report that it would reach £6,000. The actual decrease on this item was £5,699 19s. 5d. The Sub-Collector's estimate



Cotton Plantation, Northern Territory.

of last year was that revenue for 1906 would not reach £15,000, but the almost inevitable law of compensation came to his assistance, and £2,303 16s. 4d., and £602 15s. 2d. excess was received on spirits and rice, respectively—the excess on these items being directly attributable to the prohibition of opium causing a greater consumption of spirits and rice by the Chinese. For 1907 imports were valued over £78,996, and exports £139,261, exclusive of cattle.

The Future of the Territory.

Major-General Sir William Jervois, R.E., once Governor of South Australia, when visiting Port Darwin some years since in connection with defence matters, said—"Port Darwin is the key to the East," and some enthusiastic believers in the country declare that at Port Darwin the future emporium and gateway of Australia will be found. The same gentleman, in speaking of its commercial importance, used frequently to remark, in vindication of South Australia's independent undertakings in the Northern Territory, that it would not only well repay the Government their outlay, but present such a source of national wealth as to see in

future "the tail waggle the dog." At the present time the Northern Territory is indebted to South Australia for advances made to the extent of several millions sterling, and what with interest payments, losses on the short line of railway from Port Darwin to Pine Creek, cost of government there is an annual deficit of over £100,000. A tentative agreement has been made for the transfer of the country to the Commonwealth Government. A Bill agreed to by the State Parliament during the session of 1907 is now in the hands of the Federal Government. Various proposals have been made for connecting the Northern Territory with Southern Australia by a railway, but up to the present time there is a gap of 1,100 miles between Oodnadatta and Pine Creek.

Further information concerning the Northern Territory can be obtained upon application to Mr. F. E. Benda, Secretary to the Minister Controlling the Northern Territory, Government Offices, Adelaide.



Cocoanut Avenue, Botanic Gardens, Port Darwin.

[P. Foelsche. Photo.]

APPENDICES.

The following tables give the latest available statistical information at the time of going to press :—

POPULATION.

RETURN SHOWING ESTIMATED POPULATION OF SOUTH AUSTRALIA PROPER, METROPOLITAN, AND EXTRA-METROPOLITAN DISTRICTS.

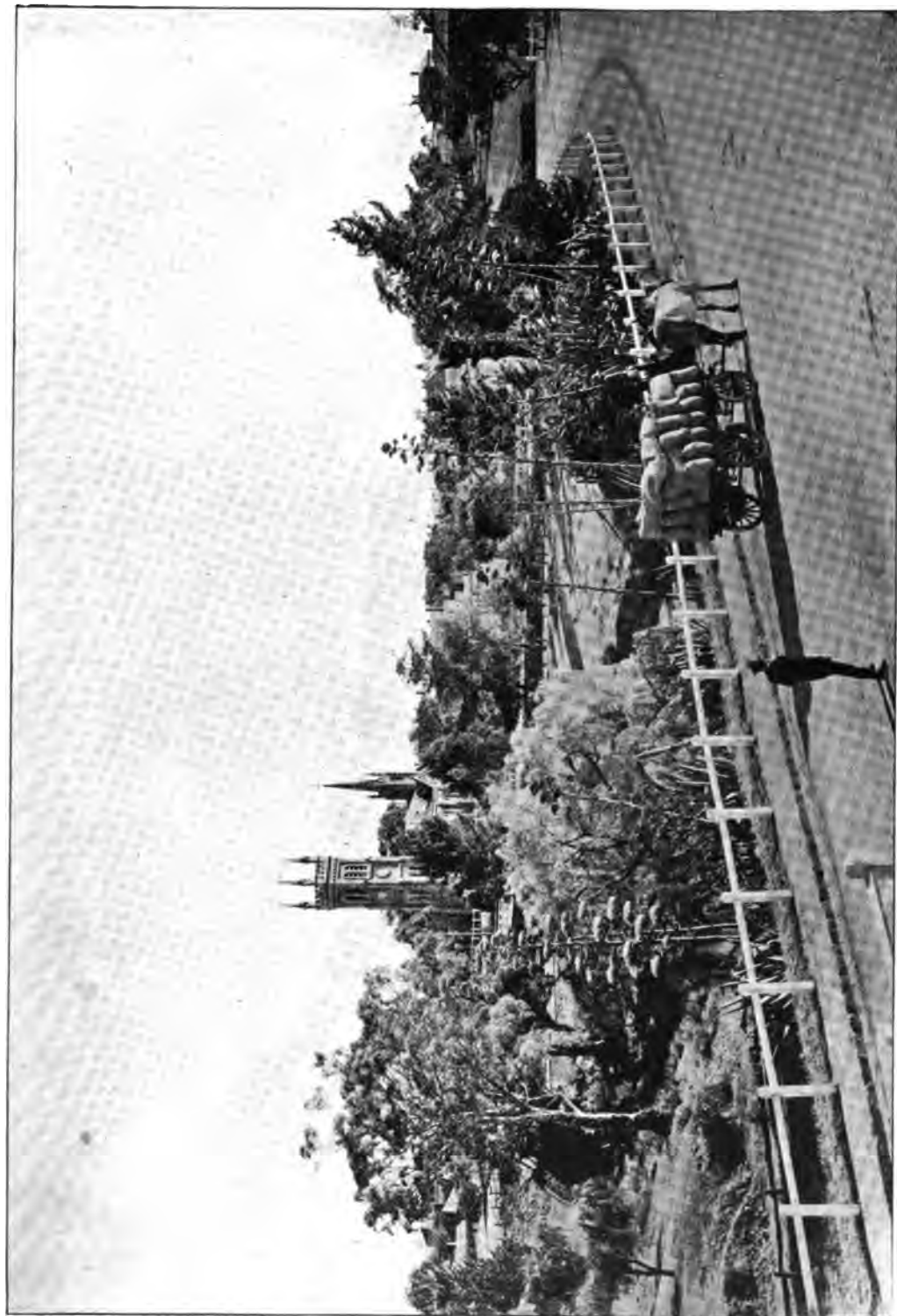
Year ended December 31st.	Total—South Australia Proper.			Metropolitan (Adelaide and Suburbs).			Extra-Metropolitan Districts.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1904 ..	187,906	180,746	368,652	81,489	89,240	170,729	106,417	91,507	197,923
1905 ..	194,241	180,157	374,398	82,581	90,654	173,235	111,600	89,503	201,163
1906 ..	200,451	179,794	380,245	83,661	91,980	175,641	116,790	87,814	204,604
1907 ..	209,294	183,137	392,431	84,851	93,449	178,300	124,443	89,688	214,131
June 30, 190	208,575	186,117	394,692	—	—	—	—	—	—

On September 1st, 1908, it was estimated that the total population exceeded 400,000.

BIRTHS, MARRIAGES, AND DEATHS.

RETURN SHOWING THE NUMBER OF BIRTHS, MARRIAGES, AND DEATHS WHICH WERE REGISTERED IN SOUTH AUSTRALIA (EXCLUSIVE OF THE NORTHERN TERRITORY) IN THE YEAR 1907, AND THE PROPORTION OF BIRTHS, MARRIAGES, AND DEATHS TO EVERY THOUSAND PERSONS LIVING.

Districts.	Total Number of—			Proportion to every Thousand of the Mean Population of—		
	Births.	Marriages.	Deaths.	Births.	Marriages.	Deaths.
Metropolitan { City of Adelaide ..	871	687	879	21.71	17.13	21.91
{ Suburbs ..	3,174	996	1,176	23.19	7.28	8.59
Total Metropolitan ..	4,045	1,683	2,055	22.86	9.51	11.61
Extra-Metropolitan	5,164	1,387	1,681	24.91	6.69	8.11
Total South Australia ..	9,209	3,070	3,736	23.97	7.99	9.72



(APPENDICES.)

ALONG A COUNTRY ROAD. STRATHALBYN.

[*Guest. Photo.*]

LAND.

TRANSACTIONS IN LAND SINCE THE FOUNDATION OF THE STATE TO
JUNE 30TH, 1908.

	Area in Acres.	Amount Received.		
		£	s.	d.
Area sold in fee simple	8,275,896	10,144,829	19	10
Area granted University, &c. .. .	122,027	—	—	—
Dedicated to Renmark Settlement .. .	16,662	—	—	—
Dedicated to Conservator of Forests .. .	162,262	—	—	—
Agreement to purchase	1,092,661	424,371	19	4
Credit selections	3,713	3,881	17	11
Scrub leases, instalment paying .. .	60,397	55,065	16	8
Total alienated, &c.	9,733,398	10,628,169	13	9
<i>Leased Lands—</i>				
Right of purchase leases	4,521,469	25,763	19	7
Perpetual leases	12,810,523	56,274	6	2
Miscellaneous leases	1,330,616	6,676	5	2
Selectors' leases	58,661	590	15	5
Grazing and cultivation leases .. .	58,916	150	19	5
Reserved lands, South-East District .. .	27,192	209	4	10
Aboriginal leases and licences .. .	505,476	11	5	0
Pastoral lands	80,334,450	24,431	17	8
Total leased	99,647,293	£114,108	13	3

Area Surveyed.

Open to allotment—Crown lands	1,118,322 acres
“ Pastoral lands	14,423,040 “
“ Miscellaneous lands	173,366 “

LANDS REPURCHASED FOR CLOSER SETTLEMENT AND HOMESTEAD BLOCKS.

338,623 acres 1 rood 7 perches (15,831 acres 3 roods 22 perches leasehold given in). Original purchase money, £421,067 2s. 10d.; repurchased at £911,166 19s. 7d.

	Area in Acres.	Amount Received.		
		£	s.	d.
Sold for cash	7,724	20,483	17	0
Agreements to purchase	263,047	*20,401	6	4
		†9,007	13	2
Total alienated, &c.	270,771	49,892	16	6
Right of purchase leases (homestead) .. .	1,704	389	19	2
Perpetual leases	77,249	7,334	2	7
Miscellaneous leases	211	25	4	3
	79,164	7,749	6	0

* On lands. † Improvements.

Grand total of closer settlement lands in occupation, 349,935 acres.

CROPS.

RETURN SHOWING THE GROSS PRODUCE AND AVERAGE YIELD PER ACRE
OF THE UNDERMENTIONED CROPS.

Year.	Wheat.		Barley.		Oats.	
	Produce.	Average.	Produce.	Average.	Produce.	Average.
	Bushels.	Bushels.	Average.	Bushels.	Bushels.	Bushels.
1903-4	13,209,465	7-72	487,920	17-00	902,936	15-69
1904-5	12,023,172	6-53	346,718	14-50	555,696	10-98
1905-6	20,143,798	11-48	505,916	19-27	869,146	15-26
1906-7	17,466,501	10-36	491,246	17-47	896,166	15-72
1907-8	19,135,557	10-91	566,937	15-19	874,388	13-19

Year.	Peas.		Hay.		Potatoes.		Wattle Bark.
	Produce.	Average.	Produce.	Average.	Produce.	Average.	
	Bushels.	Bushels.	Tons.	Tons.	Tons.	Tons.	
1903-4	121,580	18-80	479,723	1-30	31,415	3-65	8,170
1904-5	93,818	13-25	294,252	1-09	19,521	2-36	7,343
1906-7	140,367	19-63	398,866	1-34	22,277	2-25	7,274
1907-8	117,994	15-70	376,170	1-14	20,373	2-24	7,787

THE VINTAGE OF 1908.

The Government Statist having communicated with the wine manufacturers of the State respecting the last vintage, reports that from the returns received he estimates that 2,061,987galls. of wine were made, against 2,495,434galls. in 1907, a decrease of 17-37 per cent. Owing to weather conditions a decrease variously estimated from 15 per cent. to 25 per cent. had been expected.

The wine in stock on June 30th, 1908, amounted to 4,641,622galls., against 5,392,245galls. on June 30th, 1907.

The quantity and value of wine exported during the year 1907 has only been exceeded once, viz., in 1902.

The following are the exports of wine during the last six years:—1902, 846,691galls., value £124,916; 1903, 561,830galls., value £94,660; 1904, 686,159galls., value £107,573; 1905, 718,660galls., value £103,138; 1906, 562,819galls., value £99,247; 1907, 737,664galls., value £120,393.

LIVE STOCK.

RETURN SHOWING THE NUMBER AND DESCRIPTION OF LIVE STOCK IN
SOUTH AUSTRALIA.

Year.	Horses.	Year.		Sheep.	Goats.	Pigs.
		Milch Cows.	Other.			
1903-4	176,648	83,348	161,262	5,298,720	11,650	88,246
1904-5	183,481	88,156	184,303	5,820,301	13,386	111,497
1905-6	196,114	93,069	207,652	6,140,600	14,138	117,762
1906-7	206,633	97,843	227,881	6,624,941	14,317	111,240
1907-8	208,639	100,743	233,928	6,829,637	13,428	90,741

TOTAL TRADE WITH ALL COUNTRIES.

RETURN SHOWING TOTAL TRADE OF SOUTH AUSTRALIA WITH ALL COUNTRIES.

Country.	1904.	1905.	1906.	1907.
COMMONWEALTH OF AUSTRALIA—		£	£	£
New South Wales	4,725,727	5,669,260	6,893,528	8,706,973
Victoria	1,805,564	2,163,405	2,193,274	2,643,506
Queensland	787,631	640,606	739,292	839,173
Western Australia	736,516	695,416	813,150	916,930
Tasmania	61,155	126,347	142,575	126,049
Northern Territory	—	—	—	—
Total Commonwealth	8,116,593	9,295,034	10,781,819	13,232,631
UNITED KINGDOM	4,642,245	4,588,477	6,064,311	6,823,244
Total Other British Possessions	1,377,978	1,548,279	1,730,126	1,932,548
Total British Possessions	14,136,816	15,431,790	18,576,256	21,988,423
Total Foreign Countries	1,978,900	2,498,486	3,059,179	4,030,214
GRAND TOTAL	16,115,716	17,930,276	21,635,435	26,018,637

TOTAL IMPORTS AND EXPORTS.

DECENNIAL RETURN SHOWING TOTAL IMPORT AND EXPORT TRADE, AND BALANCE OF TRADE, &c., OF SOUTH AUSTRALIA.

Year.	Total Import and Export Trade.	Total Imports.	Imports Retained for Home Consumption.	Imports Re-exported.	Total Exports.	Exports Produce of the State.	Balance S.A. Produce Exported over Imports Consumed.	Balance Imports Consumed over S.A. Produce Exported.
	£	£	£	£	£	£	£	£
1898 ...	12,980,579	6,184,805	1,876,040	4,308,765	6,795,774	2,487,009	610,969	—
1899 ...	15,272,754	6,884,358	2,441,007	4,443,351	8,388,396	3,945,045	1,504,038	—
1900 ...	16,063,709	8,034,552	3,615,912	4,418,640	8,029,157	3,610,517	—	5,395
1901 ...	15,387,477	7,371,588	3,572,300	3,799,288	8,015,889	4,216,601	644,301	—
1902 ...	13,772,296	6,073,782	3,144,215	2,929,567	7,698,514	4,768,947	1,624,732	—
1903 ...	14,919,072	6,618,627	3,475,701	3,142,926	8,300,445	5,157,519	1,681,818	—
1904 ...	16,115,716	7,450,716	4,515,821	2,934,895	8,665,000	†5,730,105	1,214,434	—
1905 ...	17,930,276	8,439,609	4,980,561	3,459,048	9,490,667	†6,031,619	1,051,058	—
1906 ...	21,635,435	9,702,264	5,208,934	4,493,330	11,933,171	†7,439,841	2,230,907	—
1907 ...	26,018,637	12,120,052	7,023,505	5,096,547	13,898,585	†8,802,038	1,778,533	—

† Estimated as regards proportion of inter-State transfers.

NOTE.—Northern Territory included from 1904.

EXPORTS—SOUTH AUSTRALIAN PRODUCTS.

VALUE OF PRODUCE OR MANUFACTURES OF SOUTH AUSTRALIA EXPORTED TO EACH COUNTRY.

	1904.	1905.	1906.	1907.
	£	£	£	£
COMMONWEALTH OF AUSTRALIA—				
New South Wales	*2,322,695	*2,383,260	*2,401,067	*2,963,825
Victoria				
Queensland				
Western Australia				
Tasmania				
Northern Territory				
UNITED KINGDOM	2,409,758	2,335,377	3,064,812	3,498,485
Total Other British Possessions ..	435,986	498,226	626,683	768,465
Total British Countries	5,168,439	5,216,863	6,092,562	7,230,955
Total Foreign Countries	561,666	814,756	1,347,279	1,571,063
GRAND TOTAL STAPLE EXPORTS	5,730,051	6,031,619	7,439,841	8,802,038

* Estimated.

NOTE.—Northern Territory included from 1904.

PRINCIPAL STAPLE PRODUCTS EXPORTED.

QUANTITIES AND VALUES OF SOME OF THE PRINCIPAL ARTICLES EXPORTED, PRODUCE OR MANUFACTURES OF THE STATE OF SOUTH AUSTRALIA.

Article.	Quantity.			Declared Value.		
	1905.	1906.	1907.	1905.	1906.	1907.
				£	£	£
Agricultural implements .. value	—	—	—	51,767	54,118	38,876
Animals—Live	—	—	—	243,897	317,685	383,885
Bark tons	7,040	7,138	6,242	54,475	59,996	57,248
Beer gallons	33,433	52,598	123,014	3,267	4,429	9,807
Biscuits lbs.	70,225	54,196	54,047	1,611	1,302	1,500
Butter	1,479,895	2,202,885	2,362,388	73,264	103,171	112,739
Eggs doz.	2,842,078	2,779,625	3,135,992	102,932	106,873	122,191
Fruit—Fresh and preserved .. value	—	—	—	82,640	77,163	73,443
Dried	—	—	—	25,185	37,914	86,021
Grain—Barley bushels	58,460	152,258	201,522	10,342	26,795	39,094
Bran and pollard tons	7,917	12,043	9,869	36,809	52,716	47,339
Flour	60,292	76,328	70,967	474,867	559,555	583,448
Oats bushels	75,272	137,565	223,115	8,806	16,061	26,758
Wheat	7,805,512	12,306,087	13,146,662	1,341,752	2,012,915	2,267,735
Hay and chaff tons	30,462	68,866	59,318	93,922	165,420	231,946
Jams lbs.	1,572,915	1,789,971	1,321,248	20,695	24,394	18,454
Leather value	—	—	—	36,469	33,521	42,353
Meat—Fresh lbs.	130,959	136,061	201,053	2,200	2,605	2,712
Frozen mutton and lamb .. lbs.	7,442,415	8,670,795	9,962,324	119,920	133,805	171,593
“ poultry value	—	—	—	990	195	107
“ rabbits	—	—	—	12,678	10,417	8,281
Preserved lbs.	1,808,477	1,649,738	877,168	32,181	30,633	27,069
Metal—Copper and matte .. tons	6,853	9,008	9,146	448,092	763,377	774,667
Gold ozs.	23,090	16,219	10,407	76,558	52,384	32,200
Ore, copper tons	4,247	3,087	3,006	35,339	38,883	47,096

PRINCIPAL STAPLE PRODUCTS EXPORTED—continued.

QUANTITIES AND VALUES OF SOME OF THE PRINCIPAL ARTICLES EXPORTED, PRODUCE OR MANUFACTURES OF THE STATE OF SOUTH AUSTRALIA—continued.

Article.	Quantity.			Declared Value.		
	1905.	1906.	1907.	1905.	1906.	1907.
Salt tons	40,442	44,080	49,124	£ 68,368	£ 76,248	£ 85,604
Skins and hides value	—	—	—	345,708	411,830	443,295
Tallow tons	626	1,046	1,595	12,127	27,065	47,209
Wine gallons	718,660	562,819	737,064	103,138	99,247	120,393
Wool lbs.	40,784,613	41,771,682	50,630,368	1,491,943	1,561,664	2,100,067
All other value	—	—	—	620,397	577,460	798,908
Total	—	—	—	*6,031,619	*7,439,841	*8,802,038

* Estimated as regards proportion of inter-State transfers.

NOTE.—Northern Territory included from 1904.

WHEAT EXPORTED.

RETURN SHOWING QUANTITY OF SOUTH AUSTRALIAN WHEAT EXPORTED, AND COUNTRIES TO WHICH EXPORTED.

Country to which Exported.	1904.	1905.	1906.	1907.
Commonwealth of Australia—	Qrs.	Qrs.	Qrs.	Qrs.
New South Wales	1,425	2,092	1,815	23,298
Victoria	227	591	25	8,874
Queensland	3	—	4	55
Western Australia	1,692	2,732	3,161	777
Tasmania	17,047	39,027	28,538	30,854
Northern Territory	—	—	—	—
Total	20,394	44,442	33,543	63,858
New Zealand	—	—	—	1,054
United Kingdom	678,303	622,165	992,331	1,120,560
Cape Colony	127,534	213,284	253,977	319,786
Hongkong	—	—	—	8,033
Malta	—	—	—	—
Mauritius	—	—	—	—
Natal	30,451	15,726	9,200	17,484
St. Helena	—	—	—	—
Belgium	—	1,746	—	1,867
Chili	—	—	112,226	30,687
Delagoa Bay	—	—	—	—
Egypt	2,121	—	20,184	—
France	2,334	—	—	—
Germany	—	—	—	3,208
Italy	—	1	23,744	—
Java	4	6	13	1
New Caledonia	—	—	—	—
Peru	5,587	57,116	62,451	25,277
Portuguese East Africa	47	—	—	526
Spain	—	21,203	20,540	—
Sweden	—	—	10,052	—
Ceylon	—	—	—	8
India	—	—	—	1,606
China	—	—	—	48,818
Japan	—	—	—	560
Grand total	866,775	975,689	1,538,261	1,643,333

FLOUR EXPORTED.

RETURN SHOWING QUANTITY OF SOUTH AUSTRALIAN FLOUR EXPORTED, AND COUNTRIES TO WHICH EXPORTED.

Country to which Exported.	1904.	1905.	1906.	1907.
	Tons.	Tons.	Tons.	Tons.
Commonwealth of Australia—				
New South Wales	5,582	6,012	5,909	11,233
Victoria	236	280	744	403
Queensland	7,547	6,160	6,738	7,162
Western Australia	8,922	4,522	4,866	2,732
Tasmania	386	310	110	20
Northern Territory	—	—	—	—
Total	22,653	17,284	18,367	21,540
New Zealand	80	10	—	509
United Kingdom	11,654	13,640	10,239	4,358
Cape Colony	3,306	1,996	3,389	2,655
Ceylon	647	1,677	1,153	1,557
Egypt	—	—	33	11
Fiji	44	—	—	—
Hongkong	55	—	529	—
India	—	—	—	—
Mauritius	—	261	2,892	1,000
Natal	13,186	8,198	9,827	11,174
St. Helena	—	100	50	50
Straits Settlements	576	5,481	12,261	8,349
Bourbon	500	—	—	—
Chili	—	—	—	—
China	—	—	—	—
Delagoa Bay	—	15	—	—
Friendly Islands	—	—	—	—
Germany	—	—	25	—
Japan	—	—	10	—
Java	8,027	10,916	13,680	14,722
Netherlands	—	—	—	—
New Caledonia	21	—	—	—
Philippine Islands	51	—	—	—
Portuguese East Africa	5	—	2,825	4,630
Reunion	—	500	700	—
Sumatra	38	215	348	412
Grand total	60,843	60,293	76,328	70,967

BREADSTUFFS, ETC., EXPORTED.

RETURN SHOWING QUANTITY AND VALUE OF SOUTH AUSTRALIAN BREADSTUFFS, ETC., EXPORTED.

Year.	Flour.		Bran and Pollard.		Wheat.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Bushels.	£
1904	60,843	477,132	9,486	31,233	866,778	1,115,281
1905	60,292	474,867	7,917	36,809	975,689	1,341,752
1906	76,328	559,555	12,199	52,716	1,538,261	2,012,915
1907	70,967	583,448	9,869	47,339	1,643,333	2,267,735

BREADSTUFFS, ETC., EXPORTED—*continued.*RETURN SHOWING QUANTITY AND VALUE OF SOUTH AUSTRALIAN BREADSTUFFS, ETC., EXPORTED—*continued.*

Year.	Barley.		Oats.		Total Value.
	Quantity.	Value.	Quantity.	Value.	
	Bushels.	£	Bushels.	£	£
1904	140,760	18,567	54,272	5,039	¥1,649,414
1905	58,460	10,342	75,272	8,086	†1,877,318
1906	152,258	26,795	137,565	16,061	‡2,676,959
1907	201,522	39,094	223,115	26,758	||2,974,860

* Includes maize, oatmeal, &c., £2,162.
 ‡ Includes maize, oatmeal, pease, &c., £8,917.

† Includes maize, oatmeal, &c., £5,462.
 || Includes maize, oatmeal, pease, &c., £10,486.

EXPORTS OF WOOL.

RETURN SHOWING THE SHIPMENT OF WOOL

Year.	South Australian.			Other Australian.			Total.		
	Lbs.	Bales.	Value.	Lbs.	Bales.	Value.	Lbs.	Bales.	Value.
			£			£			
1904 ..	37,530,200	112,018	1,367,473	2,669,551	8,421	111,729	40,199,751	120,439	1,479,202
1905 ..	40,784,613	121,250	1,491,943	4,430,154	13,632	176,271	45,214,767	134,882	1,668,214
1906 ..	41,771,682	124,674	1,561,564	12,162,879	37,087	437,706	53,934,561	161,851	1,999,270
1907 ..	50,639,368	156,231	2,100,067	10,570,078	30,274	410,684	61,209,446	186,505	2,510,751

WOOL—LONDON PRICES.

RETURN SHOWING THE PRICE PER POUND OF ADELAIDE WOOL (AVERAGE GREASY) AT THE LONDON SALES.

Sales.	1904.	1905.	1906.	1907.	Sales.	1904.	1905.	1906.	1907.
January ..	d. 8	d. 8½	d. 9	d. 9½	July ..	d. 8½	d. 9½	d. 9	d. 9½
February ..	—	—	—	—	August ..	—	—	—	—
March ..	7½	7½	9½	9½	September ..	8½	9½	9	10
April ..	—	—	—	—	October ..	—	—	—	10
May ..	8	8½	9½	9½	November ..	—	—	—	9½
June ..	—	—	—	—	December ..	8½	9	9½	8½

METALS AND MINERALS.

RETURN SHOWING OUTPUT AND VALUE OF VARIOUS METALS AND MINERALS PRODUCED IN SOUTH AUSTRALIA.

Year.	Gold.		Silver.		Silver Lead Ore.		Copper.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Ounces.	£	Ounces.	£	Tons.	£	Cwts.	£
1904	17,897	76,025	—	—	—	—	125,560	382,356
1905	10,983	45,853	—	—	—	—	139,059	426,511
1906	8,037	27,000	801	104	—	—	164,160	718,609
1907	5,609	20,540	5,845	780	1,000	11,000	158,620	690,000

MINES AND MINERALS—*continued.*RETURN SHOWING OUTPUT AND VALUE OF VARIOUS METALS AND MINERALS PRODUCED IN SOUTH AUSTRALIA—*continued.*

Year.	Copper Ore and Regulus.		Lead.		Ironstone Flux.		Limestone Flux.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Cwts.	£	Tons.	£	Tons.	£
1904	3,051	24,597	—	—	46,687	27,091	43,440	6,516
1905	2,563	23,434	1,040	369	84,483	48,577	44,498	4,791
1906	—	—	1,000	550	75,226	33,852	31,940	4,791
1907	—	—	—	—	84,600	38,100	31,100	5,800

Year.	Phosphate Rock.		Crude Salt.		Other Metals and Minerals.	Total Value.
	Quantity.	Value.	Quantity.	Value.		
	Tons.	£	Tons.	£	£	£
1904	3,000	3,000	40,000	12,000	198	531,783
1905	5,000	5,000	32,500	13,000	1,261	573,796
1906	5,850	5,850	55,000	27,500	2,209	820,465
1907	8,000	8,000	75,000	37,500	2,500	814,220

SHIPPING.

RETURN SHOWING NUMBER AND TONNAGE OF VESSELS ENTERED INWARDS.

Year.	From United Kingdom.		Other British Possessions.		From Foreign States.		Total.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
1904	145	496,460	85	115,822	135	336,384	1,190	2,367,849
1905	149	540,576	122	182,888	138	331,375	1,273	2,625,997
1906	164	574,945	113	159,402	151	366,060	1,301	2,785,199
1907	183	641,341	115	178,691	175	449,509	1,300	2,925,973

NOTE.—Northern Territory included from 1905.

RETURN SHOWING NUMBER AND TONNAGE OF VESSELS CLEARED OUTWARDS.

Year.	From United Kingdom.		Other British Possessions.		From Foreign States.		Total.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
1904	159	437,928	47	46,405	57	173,383	1,208	2,398,135
1905	151	442,264	51	47,360	107	266,732	1,264	2,632,233
1906	193	542,095	98	128,549	131	331,549	1,304	2,779,109
1907	201	603,778	84	125,771	137	389,700	1,306	2,957,319

NOTE.—Northern Territory included from 1905.

RAILWAYS.

COMPARATIVE SUMMARY OF THE WORKING OF SOUTH AUSTRALIAN RAILWAYS FOR
YEAR ENDED JUNE 30TH, 1908, WITH YEAR ENDED JUNE 30TH, 1907.

Items.	1907-8.	1906-7.
Miles open at close of year, 3ft. 6in. gauge No.	1,280	1,238
Miles open at close of year, 5ft. 3in. gauge No.	599½	594½
Average miles open for the year No.	1,860½	1,814½
Capital cost on miles open and completed £	13,909,635	13,724,301
Capital cost per mile open and completed £	7,402	7,491
Passenger traffic by ordinary and season tickets £	418,789	370,983
Coaching traffic other than the above £	92,634	81,295
Mineral traffic freight £	475,210	398,841
Wheat traffic freight £	84,240	93,590
Wool traffic freight £	34,219	31,835
Goods traffic freight other than the above £	491,689	484,054
Livestock traffic freight £	99,529	75,184
Miscellaneous earnings £	44,969	39,586
REVENUE—(Gross earnings) £	1,741,259	1,575,368
Working expenses £	969,530	868,005
Net Revenue (balance after paying working expenses) £	771,729	707,363
Percentage of Working Expenses to Revenue %	55·68	55·10
Percentage of Net Revenue to Capital Cost (on average miles open) %	5·57	5·16
Number of passenger journeys No.	12,839,428	11,497,802
Minerals carried tons	1,146,365	997,348
Wheat carried "	291,875	316,548
Wool carried "	22,485	20,578
Goods carried other than the above "	748,255	669,546
Livestock carried "	47,016	38,919
Goods and livestock, gross tonnage, freight paying "	2,25 ,998	2,042,939
Train miles	5,010,121	4,334,243
Total earnings per train mile d.	83·41	87·23
Total working expenses per train mile d.	46·44	48·06
Total earnings per average mile open £	936	868
Total working expenses per mile open £	521	478
Locomotives No.	331	328
Coaching vehicles No.	443	429
Goods and livestock vehicles No.	6,226	6,140
Departmental wagons, travelling tanks, cranes, &c. No.	221	221
Population, excluding aborigines, at close of year, approximately	400,000	383,000
Miles of line open for every 1,000 of population, approximately	4·70	4·78
Population for every mile of line opened No.	213	209

The above is exclusive of the Palmerston line.

REVENUE.

RETURN OF STATE REVENUE, 1904-5 TO 1907-8.

Year.						Estimated.	Actual.	Excess exceeded by	Estimate not realised by
						£	£	£	£
1904-5	..	..	..	..	..	2,618,947	2,725,724	106,777	—
1905-6	..	..	..	..	..	2,619,951	2,806,011	186,060	—
1906-7	..	..	..	..	..	2,858,234	3,195,285	337,051	—
1907-8	..	..	..	..	..	3,095,329	3,654,666	559,337	—

EXPENDITURE.

RETURN OF STATE EXPENDITURE, 1904-5 TO 1907-8.

Year.						Estimated.	Actual.	Unexpended.	Excess.
						£	£	£	£
1904-5	..	..	..	..	..	2,585,476	<i>b</i> 2,650,020	—	64,544
1905-6	..	..	..	..	..	2,650,402	<i>c</i> 2,718,537	—	68,135
1906-7	..	..	..	..	..	2,851,768	<i>d</i> 2,897,612	—	45,844
1907-8	..	..	..	..	..	3,086,906	<i>e</i> 3,171,143	—	84,237

b Exclusive of £43,475*c* Exclusive of £87,474*d* Exclusive of £297,673*e* Exclusive of £483,523

paid over to Public Debt Sinking Fund to meet redemption of public securities.

BANKS—LIABILITIES AND ASSETS.

RETURN SHOWING THE AVERAGE LIABILITIES AND ASSETS OF THE SEVERAL BANKS
IN THE LAST QUARTER OF EACH YEAR.

LIABILITIES.

Year.			Notes in Circulation.			Bills in Circulation.			Balance due to Other Banks.			Deposits.			Total Average Liabilities.		
			£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1904	..	..	378,548	17	7	12,475	5	6	42,825	8	4	6,297,825	19	5	<i>a</i> 7,058,019	12	4
1905	..	..	373,604	8	8	7,969	3	9	52,929	0	0	6,866,281	8	9	<i>b</i> 7,623,060	4	2
1906	..	..	418,071	17	11	11,820	11	11	63,061	18	1	7,485,246	10	10	<i>c</i> 8,291,952	7	3
1907	..	..	496,326	15	0	9,565	11	2	56,422	19	10	8,163,965	0	5	<i>d</i> 9,039,843	11	0

a Including £326,544 1s. 6d. Perpetual Inscribed Stock.*c* Including £313,751 8s. 6d. Perpetual Inscribed Stock.*b* Including £322,376 3s. Perpetual Inscribed Stock.*d* Including £313,563 4s. 7d. Perpetual Inscribed Stock.

ASSETS.

Year.			Coined Gold, Silver, and other metals.			Gold and Silver in Bullion or Ingots.			Government Securities.			Landed Property and Bank Premises.		
			£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1904	..	..	1,554,651	3	4	14,986	16	3	95,571	10	10	425,941	0	3
1905	..	..	1,847,191	4	11	14,499	13	11	99,874	15	10	411,071	18	1
1906	..	..	1,755,613	13	3	15,212	7	2	121,409	17	6	407,981	9	4
1907	..	..	1,964,458	8	0	10,827	12	3	123,309	17	6	362,450	5	10

BANKS—LIABILITIES AND ASSETS—*continued.*RETURN SHOWING THE AVERAGE LIABILITIES AND ASSETS OF THE SEVERAL BANKS IN THE LAST QUARTER OF EACH YEAR—*continued.*ASSETS—*continued.*

Year.	Notes and Bills of other Banks.			Balances due from other Banks.			Notes and Bills Discounted, and other Debts to Banks not before enumerated.			Total Average Assets.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1904	56,761	19	3	71,505	0	8	4,532,073	8	0	6,751,490	18	6
1905	58,818	1	7	116,253	16	3	4,878,065	8	7	7,425,774	19	2
1906	56,353	6	7	97,857	12	3	5,306,245	5	2	7,760,673	11	3
1907	61,226	16	4	97,489	2	3	5,499,607	5	3	8,119,369	7	5

SAVINGS BANK—DEPOSITS.

Year.	No. of Accounts.	Amount.		Year.	No. of Accounts.	Amount.	
		£	s.			£	s.
1904	123,455	4,202,637		1906	131,649	4,750,192	
1905	126,821	4,380,357		1907	139,870	5,304,704	

THE STATE BANK.

The State Bank of South Australia, established under "The State Advances Act, 1895," makes advances to farmers, producers, and others to the extent of three-fifths (60 per cent.) of the value of land and improvements, and to the extent of half the selling value of Crown leases.

Advances are repayable by uniform instalments, which include principal and interest, for terms from one to forty-two years.

These instalments entirely liquidate the loan, with interest at $4\frac{1}{2}$ per cent. per annum.

The instalments for the following terms are as under:—

For each £100.

5 years	..	..	..	..	£11	5	7	half-yearly
7 "	..	..	..	..	8	8	1	"
10 "	..	..	..	..	6	5	4	"
15 "	..	..	..	..	4	12	5	"
20 "	..	..	..	..	3	16	4	"
25 "	..	..	..	..	3	7	0	"
30 "	..	..	..	..	3	1	1	"
36 "	..	..	..	..	2	16	4	"
42 "	..	..	..	..	2	13	3	"

And a proportionate instalment for all sums under £100.

Up to June 30th, 1908, the bank has advanced:—

On country freehold lands	£661,047	5	2
On country leasehold lands	111,558	13	6
On rural industries	1,750	0	0
To municipal corporations and district councils ..	12,920	0	0
On city, town, and township lands	445,988	11	3

[Legislation is being passed giving the Government authority to make advances to settlers on Crown lands. This will be a great convenience, by enabling the settler to improve his holding while waiting for the first crop.]

GOVERNMENT PRODUCE DEPARTMENT.

SCALE OF CHARGES FOR THE TREATMENT OF PRODUCE AT THE GOVERNMENT PRODUCE DEPARTMENT. (FREEZING WORKS ARE SITUATED AT PORT ADELAIDE.)

Produce.	Treatment, &c.	Extra Storage.
Lamb	0-4d. 3 lb., including handling, freezing, 4 weeks' storage, & shipping	1d. 3 oca. 3 week or any portion thereof
Mutton	0-35d. " " " 4 " "	1d. 3 oca. do.
Butter.. ..	3½d. 3 box " " 7 days' " "	1½ per box do.
Fruit—Apples, pears, oranges	1½d. 3 case " cooling, 7 " " "	1d. 3 case do.
Rabbite	1s. 6d. 3 export crate " freezing, 3 weeks' " "	1½d. 3 crate do.
Hares	1½d. 3 hare " " 4 " " "	1½d. 3 crate do.
Pork	0-55d. 3 lb. " " 4 " " "	1d. 3 oca. do.
Poultry—Ducks	8d. 3 head, which is a consolidated rate covering all shipping & selling charges	
Chicks	7d. " " " " " "	
Geese and turkeys	By special arrangement	
Poultry— for storage only	3d. 3 crate (not exceeding 2ft.), including handling and cold storage for 7 days 1d. each fowls and ducks, 2d. turkeys and geese (unorated), including handling and cold storage for 4 weeks, or any portion thereof	1½d. 3 crate do.
Eggs— For shipment	3½d. 3 dozen, which is a consolidated rate covering all shipping and selling charges	
For storage only	3d. 3 case for first week for eggs in shell packed in cases containing 25doz.	2d. 3 case do.
Eggs in pulp ..	3d. 3 case (not exceeding 2ft.) for first week	2d. 3 case do.
Cheese.. ..	3d. 3 cwt., including handling and cool storage for 7 days	2d. 3 cwt. do.
Bacon	2d. 3 side " " " 7 "	2d. 3 side do.
General storage	Beef, 8s. 3 body Lamb and mutton, 6d. 3 oca. Pork and veal, 1s. 3 oca. Joints of meat and fish, 2s. 6d. 3 cwt. } Including handling and cold storage for 4 weeks or any portion thereof	
Storage — Unenumerated	By special arrangement	
Butter factory— Charges for treatment of cream	Chilling, churning, and printing, 1d. 3 lb. Commission for selling, 5 per cent. .. Cartage to and from railway station and factory, 4d. 3 can } The railage will be paid by department and deducted from account sales	

Wharfage, at the rate of 1s. 6d. 3 ton measurement, will be charged on all produce shipped over the department's wharf.

RATES OF WAGES.

The following statement, prepared at the office of the Government Labor Bureau, shows the rates of wages current in South Australia in September, 1908 :—

Apprentices .. ..	..	..	..	1s. to 3s. 6d. per day
Blacksmiths .. ..	..	..	..	10s. per day
Bricklayers .. ..	..	..	..	11s. per day
Boilermakers .. ..	..	..	..	10s. per day
Boilermakers' assistants ..	..	..	..	7s. to 8s. per day
Builders' laborers .. ..	..	..	..	8s. per day
Brassfinishers .. ..	..	..	..	8s. 6d. to 10s. per day
Carpenters .. ..	..	..	..	10s. per day
Carpenters (rough) .. ..	..	..	..	7s. to 8s. per day
Carriage-builders .. ..	..	..	..	8s. 6d. per day
Coachsmiths .. ..	..	..	..	9s. per day
Coachpainters .. ..	..	..	..	8s. 6d. per day
Coachtrimmers .. ..	..	..	..	9s. per day
Copper-smiths .. ..	..	..	..	9s. to 10s. per day
Fitters and turners .. ..	..	..	..	10s. per day
Galvanized iron workers ..	..	..	..	9s. to 10s. per day
Ironmoulders .. ..	..	..	..	10s. per day
Laborers .. ..	..	..	..	7s. per day
" (Youth) .. ..	..	..	..	1s. 6d. to 5s. per day
Masons .. ..	..	..	..	11s. per day
Miners .. ..	..	..	..	7s. to 8s. per day
Painters and glaziers .. ..	..	..	..	8s. per day
Paperhangers .. ..	..	..	..	9s. to 10s. per day
Plasterers .. ..	..	..	..	9s. to 10s. per day
Plumbers .. ..	..	..	..	10s. per day
Pattern-makers .. ..	..	..	..	9s. to 10s. per day
Stonecutters .. ..	..	..	..	10s. per day
Strikers .. ..	..	..	..	7s. to 8s. per day
Tinsmiths .. ..	..	..	..	8s. to 9s. 6d. per day
Farm laborers .. ..	..	..	..	20s. to 35s. per week and keep
" youths .. ..	..	..	..	10s. to 15s. per week and keep
Married couples .. ..	..	..	..	£60 to £70 per an. and keep
Cooks .. ..	..	..	..	20s. to 30s. per week and keep

HOW TO GET TO SOUTH AUSTRALIA.

Apply at the office of the Agent-General for South Australia, Threadneedle House, 28, Bishopsgate Street (Within), London, for information concerning vessels on the berth for Adelaide.

The following rates of passage are approximate :—

From London to Adelaide—First saloon, from £50 to £82 10s. ; second saloon, from £40 to £46.

From San Francisco to Sydney—First saloon, £40 ; second saloon, £25.

From Brisbane to Adelaide—First saloon, £7 ; second saloon, £3 8s.

From Sydney to Adelaide—First saloon, £4 ; second saloon, £2 4s.

From Melbourne to Adelaide—First saloon, £2 10s. ; second saloon, £1.

From Fremantle (port of Perth) to Adelaide—First saloon, £6 ; second saloon, £4.

RAILWAY FARES.

ADELAIDE TO—					First Class.		Second Class.	
					£	s. d.	£	s. d.
Melbourne (single)	..	..	..	..	3	10 0	..	2 5 0
Sydney	"	..	..	..	6	0 0	..	4 0 0
Brisbane	"	..	..	..	10	0 0	..	6 10 0

OUTER HARBOR TO ADELAIDE—					First Class.		Second Class.	
					s. d.		s. d.	
Single	..	..	..	..	1	4	..	1 0
Return	..	..	..	..	2	0	..	1 5

POSTAGE RATES.

Letters (not exceeding $\frac{1}{2}$ oz.) can be posted to all parts of Australia and to the United Kingdom for 2d.

CABS AND MOTORS.

Cabs and motor cars are on hire in the principal streets, and can be engaged at reasonable rates to take tourists to all parts of the city and in the hills. Apply at State Tourists' Bureau Office at the Outer Harbor, or King William Street, Adelaide, where arrangements for touring parties can be made.

Rates for licensed cabs are—							s. d.
For the first hour	..	..	..	..	..	..	4 0
For the second hour	..	..	..	..	..	..	3 0

The charge for motor car is about 10s. per hour, according to arrangement.

SOUTH AUSTRALIA.

The Garden State of the Commonwealth.

The State Tourist Bureau

and INTELLIGENCE OFFICE,

KING WILLIAM STREET, ADELAIDE,

Will be pleased to supply information regarding

South Australia,

ITS

Beauty Spots, Health Resorts,

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TOURISTS and OTHERS will find every facility afforded for travel at a minimum expenditure of time and money. **Special Motor Trips** through the MOUNT LOFTY RANGES, together with **Combined Rail and River Excursions**, and other delightful trips are frequently arranged by the TOURIST BUREAU.

OVERSEA PASSENGERS may step direct from the MAIL STEAMERS at the OUTER HARBOUR into an Express Train, and, in less than 35 Minutes, reach ADELAIDE—the Capital, which has been rightly termed by Travellers “**THE QUEEN CITY OF THE SOUTH.**”

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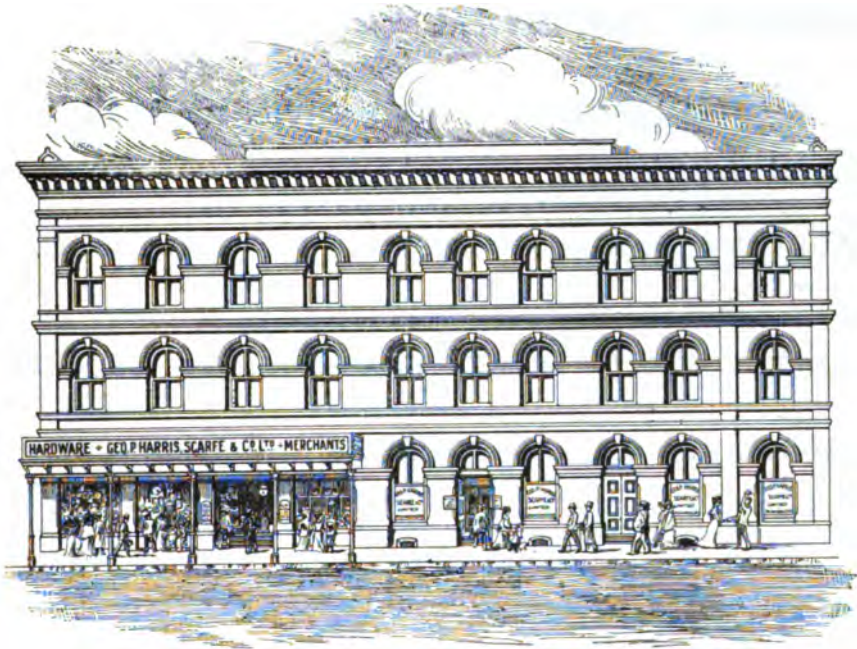
QUIBELL'S POWDER and LIQUID DIP, KOERSTZ WOOL PRESSES and PUMPS, IDEAL POISON
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Fire- and Thief-Resisting Safes and Strong-Room Doors.

Our Safes are used by the following:—

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Government.South Australian
Government.

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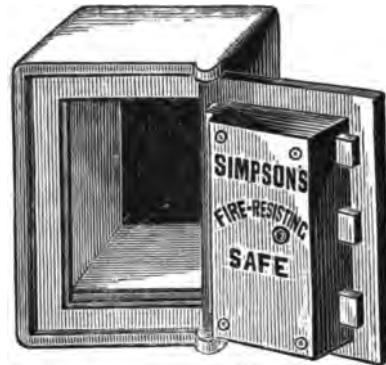
Western Australian
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DYNAMITE UNSUCCESSFUL.

The following description of a recent burglary attests the value of our PATENT EXPLOSIVE-RESISTING LOCK (the Lock of the other maker's Safe mentioned was shattered and the Door rendered capable of being opened without difficulty):—

"Dear Sirs—We beg to advise you that on the night of Friday, February 28th, 1908, burglars broke into our premises at Port Adelaide and made a very determined attempt to burst open our Fire-proof Safes with some high explosive, either Gellignite or Dynamite. Some idea can be formed of the quantity of explosive used from the fact that the large glass partitions enclosing our Offices were shattered, and windows were also more or less broken.

The excessive noise must have disturbed the burglars, who apparently, fearing detection, fled without waiting to see the result of their work. One of the Safes was of your own manufacture, and was fitted with your Patent Lock, which successfully resisted the energy which was mainly expended harmlessly on the interior of the Safe.

We may mention that this is a second occasion on which burglars have unsuccessfully attacked the same Safe, the previous time being in August, 1904, when explosives were also unsuccessfully used. We have great pleasure in testifying to the excellent workmanship of the Safe we have of your manufacture.

Yours faithfully (signed), D. & J. FOWLER, LIMITED,
Rob. J. PHILLIPS, Director."

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known.



These Signs, unlike Painted Work, neither FAD nor TARNISH, but always remain CLEAR and BRIGHT.

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PAID-UP CAPITAL	£400,000.
UNCALLED CAPITAL	£100,000.
RESERVE FUND	£300,000.
RESERVE LIABILITY of SHAREHOLDERS	£500,000.

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Brinkworth	Gumeracha	McLaren Vale	Port Broughton	Unley
Caltowie	Hammond	Minlaton	Port Lincoln	Warooka
Carrieton	Hawker	Morgan	Port Pirie	Willowie
Clarendon	Hindmarsh	Mount Pleasant	Port Vincent	Willunga
Cowell	Hoyleton	Mount Torrens	Snowtown	Woodside
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Reserve Fund	£1,600,000
Reserve Liability of Proprietors	£2,500,000
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Paid-up Capital	£1,500,000
Reserve Funds { of which £351,166 invested in Consols; £195,834 in Local Loans Imperial Government Stock; £150,000 in National War Loan. 1900. Balance employed in the business of the Bank }	1,280,000
TOGETHER	£2,780,000
Reserve Liability of Proprietors	3,000,000
Head Office—71, Cornhill, London, E.C.	£5,780,000

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INCORPORATED UNDER THE "COMPANIES ACT, 1890."

Authorised Capital	£3,407,904
CAPITAL PAID UP	£1,498,220
RESERVE FUND ACCOUNT	180,000
(Used in the business of the Bank)	
RESERVE LIABILITY OF SHAREHOLDERS ..	715,464
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ENGLISH, SCOTTISH, AND AUSTRALIAN BANK, LIMITED.

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Paid up to £12 10s.	£539,437 10s.
Further Liability of Proprietors	£539,437 10s.
Reserve Funds and Undivided Profits (used in the general business of the Bank)	£201,990
The Perpetual Inscribed Stock of the Bank amounts to over ..	£2,650,000

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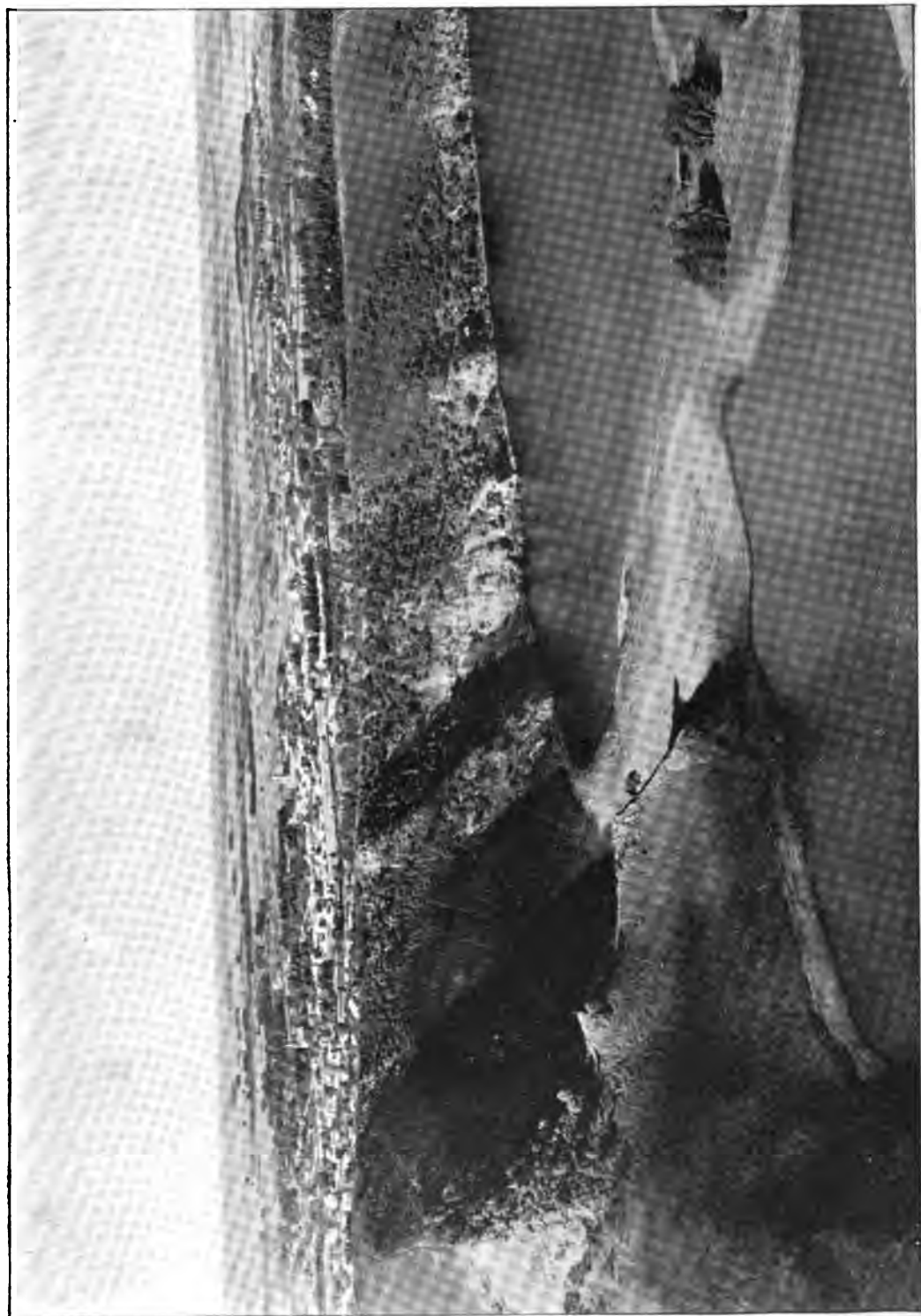
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Conversion of Horse Trams to Electric Traction.—Breaking up Grenfell Street, preparatory to putting down the rails.

[W. S. Smith, Photo.]



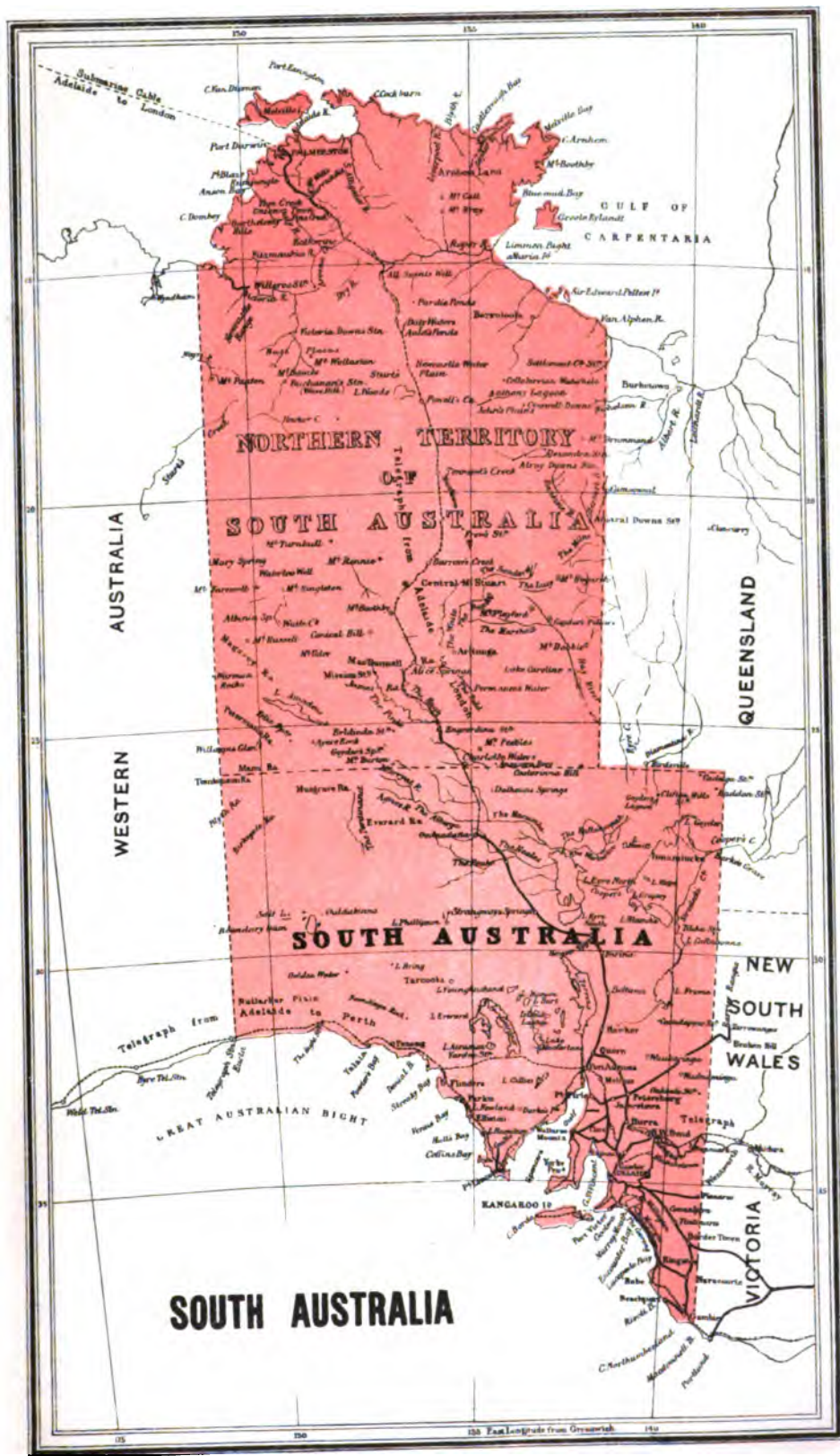
Testing the First Electric Tramcar in Adelaide.

[W. S. Smith, Photo.]



Trial Run of the First Electric Tramcar.—An electric system of tramway traction was opened by Mrs. Price, wife of the Premier (Hon. T. Price), on December 23rd, 1908.

[W. S. Smith, Photo.]



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